Vol. 1048 Number 2

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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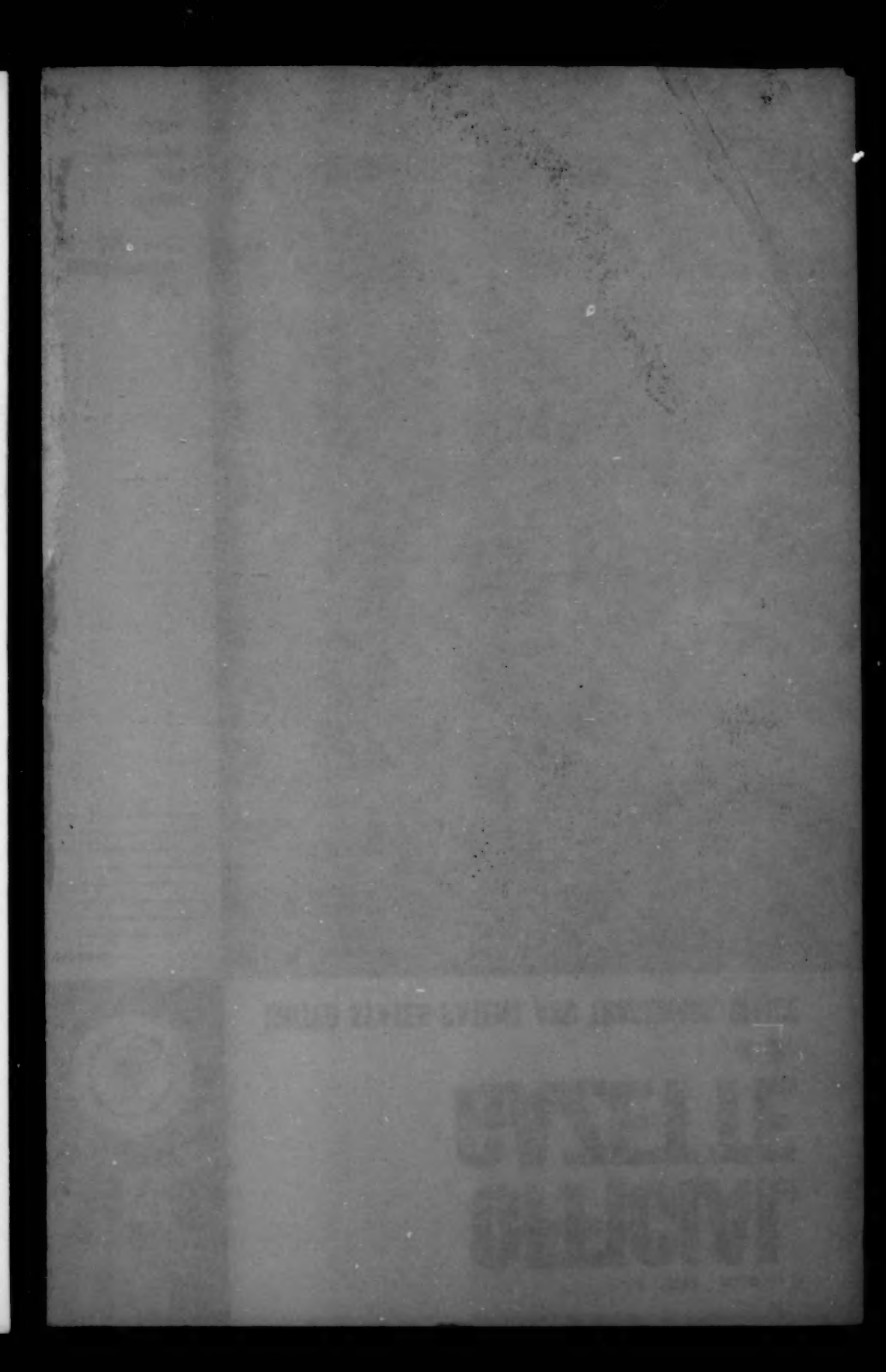

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

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Apr. 13, 1984.

GERALD J. MOSSINGHOFF,
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Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 10, 1981 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	4,787 through 4,789
Utility Patents	4,298,991 through 4,300,239

Reissue Patents based on the above identified patents. No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))	$ 200.00
By other than a small entity	$ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f))	$ 50.00
By other than a small entity	$ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,009,007, Re. S.N. 634,036, Filed July 24, 1984, Cl. 075/230, TANTALUM POWDER AND METHOD OF MAKING THE SAME, Stanley S. Fry, Owner of Record: *Fansteel, Inc., N. Chicago, Ill.,* Attorney or Agent: George B. Finnegan, Jr., Ex. Gp.: 223

4,104,773, Re. S.N. 634,062, Filed July 25, 1984, Cl. 029/127, ROLL MANUFACTURING METHOD AND ROLL, PARTICULARLY FOR PAPER MACHINES, Vaino Sailas, Owner of Record: *Valmet Oy, Helsinki, Finland,* Attorney or Agent: Harold D. Steinberg, Ex. Gp.: 326

4,171,314, Re. S.N. 632,146, Filed July 18, 1984, Cl. 549/264, 13-HALO AND 13-DEOXY C-076 COMPOUNDS, John C. Chabala, et al., Owner of Record: *Merck & Co., Inc., Rahway, N.J.,* Attorney or Agent: Mario A. Monaco, et al., Ex. Gp.: 129

4,231,057, Re. S.N. 240,498, Filed Mar. 4, 1981, Cl. 357/50, SEMICONDUCTOR DEVICE AND METHOD FOR ITS PREPARATION, Yoshinobu Momma, et al., Owner of Record: *Fujitsu Ltd., Kawasaki, Japan,* Attorney or Agent: James D. Halsey, Jr., et al., Ex. Gp.: 254

4,337,178, Re. S.N. 624,923, Filed June 27, 1984, Cl. 502/328, CATALYST FOR STEAM REFORMING OF HYDROCARBONS, Kenton Atwood, et al., Owner of Record: *United Catalysts, Inc., St. Louisville, Ky.,* Attorney or Agent: William R. Price, Ex. Gp.: 116

4,340,858, Re. S.N. 632,399, Filed July 18, 1984, Cl. 324/158P, TEST FIXTURE, James T. Malloy, Owner of Record: *Philip M. Hinderstein, Orange, Calif.,* Attorney or Agent: John J. Connors, et al., Ex. Gp.: 267

4,347,487, Re. S.N. 632,348, Filed July 19, 1984, Cl. 333/001, HIGH FREQUENCY ATTENUATION CABLE, Albert R. Martin, Owner of Record: *Raychem Corp., Menlo Park, Calif.,* Attorney or Agent: James W. Peterson, Ex. Gp.: 252

4,357,484, Re. S.N. 630,440, Filed July 13, 1984, Cl. 585/740, ADAMANTANE CATALYZED PARAFFIN ISOMERIZATION, Georg e M. Kramer, Owner of Record: *Exxon Research and Engineering Co.,* Attorney or Agent: Edward H. Mazer, Ex. Gp.: 116

4,372,147, Re. S.N. 638,397, Filed Aug. 7, 1984, Cl. 73/3, FLOW METER PROVER APPARATUS AND METHOD, Charles C. Waugh, et al., Owner of Record: *Waugh Controls Corp., Chatsworth, Calif.,* Attorney or Agent: Ronald W. Reagin, et al., Ex. Gp.: 265

4,384,523, Re. S.N. 634,035, Filed July 24, 1984, Cl. 101/210, FOUNTAIN CONTROL SYSTEM, Garth S. Ryan, Owner of Record: *Mirachem Corp. Ltee/Ltd., Brossard, Quebec, Canada,* Attorney or Agent: Robert Mitchell, et al., Ex. Gp.: 337

4,444,239, Re. S.N. 632,603, Filed July 19, 1984, Cl. 160/107, VENETIAN BLIND AND FRAME FOR VEHICLES, Richard K. Haines, Owner of Record: *Inventor,* Attorney or Agent: Richard R. Trexler, et al., Ex. Gp.: 355

4,444,865, Re. S.N. 627,006, Filed July 2, 1984, Cl. 430/409, BLENDED GRAIN DIRECT-POSITIVE EMULSIONS AND PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR THEIR USE, Robert A. Silverman, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Carl O. Thomas, et al., Ex. Gp.: 156

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,650,357, Reexam. No. 90/000,646, Requested: Oct. 10, 1984, Cl. 188/71.5, DISC BRAKE WITH HOMOGENEOUS BRAKE STACK, John P. Nelson, et al., Owner of Record: *Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: Finnegen, et al., Ex. Gp.: 314, Requester: Goodyear Tire & Rubber Co., Washington, D.C.

3,809,101, Reexam. No. 90/000,641, Requested: Oct. 1, 1984, Cl. 132/764, NAIL FILE, Takaetsu Shimizu, Owner of Record: *Takaetsu Shimizu, Tokyo, Japan,* Attorney or Agent: Peter L. Berger, Ex. Gp.: 330, Requester: Owner

3,825,754, Reexam. No. 90/000,623, Requested: Sept. 11, 1984, Cl. 250/338, DUAL SPECTRUM INFRARED FIRE DETECTION SYSTEM WITH HIGH ENERGY AMMUNITION ROUND DISCRIMINATION, Robert Cinzori, et al., Owner of Record: *Santa Barbara Research Center, Goleta, Calif.,* Attorney or Agent: William J. Bethurum, Ex. Gp.: 250, Requester: James F. Jones, Arlington, Va.

4,077,328, Reexam. No. 90/000,644, Requested: Oct. 4, 1984, Cl. 105/261A, ROTARY DUMP, Glenn Taylor, Owner of Record: *Inventor,* Attorney or Agent: Jones, et al., Ex. Gp.: 312, Requester: Diversified Metal Fabricators, Inc., Atlanta, Ga.

4,121,430, Reexam. No. 90/000,642, Requested: Oct. 2, 1984, Cl. 062/55.5, CRYOPUMP HAVING IMPROVED HEAT RADIATION SHIELDING, Werner Bachler, et al., Owner of Record: *Leybold-Heraeus GmbH & Co., KG, Koln-Bayental, G ermany,* Attorney or Agent: Spencer & Kaye, Ex. Gp.: 344, Requester: Leybold-Heraeus GmbH, c/o Kelemen, et al., Washington, D.C.

4,369,563, Reexam. No. 90/000,643, Requested: Oct. 3, 1984, Cl. 29/568, AUTOMATED MACHINE TOOL INSULATION WITH STORAGE MEANS, David T. N. Williamson, Owner of Record: *Molins Ltd., London, England,* Attorney or Agent: John C. Smith, Ex. Gp.: 320, Requester: Cross & Trecker Corp., Bloomfield Hills, Mich.

4,412,002, Reexam. No. 90/000,645, Requested: Oct. 9, 1984, Cl. 435/237, PROCESS FOR PREPARING HEPITITS A VIRUS, William J. McAleer, et al., Owner of Record: *Calgon Corp., Pittsburgh, Pa.,* Attorney or Agent: Donald J. Parella, Ex. Gp.: 120, Requester: Keith V. Rockey, et al., Chicago, Ill.

Erratum

"All reference to Patent No. 4,466,091 to Toshihiko Takagi, et al., of Japan for 'OPTICAL RECORD DISC' appearing in the Official Gazette of Aug. 14, 1984 should be deleted since no patent was granted."

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122 Nitrogen containing heterocyclic compounds, mercaptans and carbonate esters Donald G. Daus rm. 8B32 CP2 557-3920
123 Peptides, carbohydrates, aromatic nitriles hetero-O and -S containing compounds, cosmetics, dentifrices, drug and pesticide carriers, and viral immunology Donald B. Moyer rm. 8A15 CP2 557-3920
124 Nitrogen, heavy metal, silicon, halogen, acid/ester organic compounds Charles F. Warren rm. 8D31 CP2 557-3920
125 Medicines, poisons, cosmetics, testing compositions, and molecular biology Albert T. Meyers rm. 8B02 CP2 557-3920
126 Organic carboxylic acid and ester compounds, oxy, aldehyde and keto compounds, phosthorus acid compounds Natalie Trousof rm. 9B32 CP2 557-3920
127 Molecular genetics, cell culture, catalysis, enzymology, microbiology and chemical engineering Thomas Wiseman rm. 9D31 CP2 557-3920
128 Clinical chemistry, microbiology, immunology and enzymology, food technology, purification and chemical engineering Robert Warden rm. 8D19 CP2 557-3920
129 Herbicides and heterocyclic chemistry Glennon H. Hollrah rm. 9A01 CP2 ... 557-3920
130 Specialized Chemical Industries and Chemical Engineering rm. 8C17 CP3 .. 557-2475
Director Robert F. White rm. 8D19 CP3 557-3804
Secretary Vickie Enos rm. 8D19 CP3 .. 557-3804
Clerk Ruth Lyles rm. 8C17 CP3 557-9854
131 Adhesive bonding and miscellaneous chemical manufacture, compositions such as etching compositions Edward C. Kimlin rm. 7A01 CP3 557-2475
132 Sugar, starch, and food or edible material Raymond Jones rm. 8D01 CP3 ... 557-2475
133 Paper making and fiber liberation, glass manufacture, methods of cleaning and liquid contact with solids, refrigeration processes, concentrating evaporators, separatory distillation processes and apparatus S. Leon Bashore rm. 7E02 CP3 .. 557-2475
134 Chemical apparatus such as analyzers, reactors, sterilizers, crystallizers and dialyzers; processes of chemical analysis, sterilizing, preserving and miscellaneous physical processes such as crystallizing and agglomerating Barry S. Richman rm. 9B02 CP3 557-2475
135 Gas separation, solids separation and gas and liquid contact Frank W. Lutter rm. 8D35 CP3 557-2475
136 Liquid purification or separation Richard B. Fisher rm. 8B36 CP3 557-2475
137 Processes of plastic and nonmetallic article shaping or treating Donald E. Czaja rm. 8A01 CP3 557-2475
138 General molding or treating apparatus, static molds, apparatus for cutting lamina, process for molding lamina, miscellaneous formation of lamina such as by freezing or encapsulating, fuel gas formation, thermolytic distillation of materials and apparatus treating mineral oil products Jay H. Woo rm. 8B12 CP3 557-2475
150 High Polymer Chemistry, Plastics, Coating, Photography, Stock Materials and Compositions rm. 11C19 CP2 557-6525
Director James O. Thomas, Jr. rm. 11A02 CP2 557-6533
Secretary Sharon C. Graham rm. 11A04 CP2 557-6533
Clerk Ellen Scott rm. 11B14 CP2 557-6525
151 Mixed synthetic resin compositions, block and graft copolymers and irradiation of polymers John Bleutge rm. 10D02 CP2 557-6525
152 Coating processes and coating apparatus Norman Morgenstern rm. 11B02 CP2 557-6525
153 Foams, condensation polymers of cellulose, phenols, isocyanates, polyesters, polyepoxides, stabilization of polymers, process of preparing John Kight rm. 10A22 CP2 557-6525
154 Stock materials or miscellaneous articles of manufacture George Lesmes rm. 11D02 CP2 557-6525
155 Polymer compositions, addition polymers, dye compositions and processes, textile treating compositions and processes, electrically conductive compositions and carbohydrates Joseph Schofer rm. 10E02 CP2 557-6525
156 Radiation imagery chemistry - process, composition or product, and stock materials or miscellaneous articles of manufacture John Kittle rm. 11E02 CP2 557-6525
157 Special utility compositions, coating compositions, dye compositions and processes, textile treating compositions, teeth treating compositions, and abrasive compositions Paul Lieberman rm. 10A10 CP2 557-6525

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210 Industrial Electronics, Physics and Related Elements rm. 9C17 CP4 557-5080
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211 Music, acoustics, mechanical registers, motion pictures, photography and photocopying L. Thomas Hix rm. 9B40 CP4 . 557-7674
212 Motor-generator structure systems and industrial voltage regulation and conversion J. D. Miller rm. 9A01 CP4 557-9695
213 Industrial electrical furnaces, electrical resistors and electric heating, includes microwave heating and welding Bruce Reynolds rm. 9D01 CP4 557-3231
214 Electrical switches, electrical transmission systems, electrical discharge devices, electrical furnaces and electrical devices David A. Pellinen rm. 8B24 CP4 557-2885
215 Conductors, insulators, industors, electric photocopying and electrical devices Arthur Grimley rm. 9D25 CP4 557-3191
216 Recorders, scales, magnets and magnetic and thermal switches Elliott A. Goldberg rm. 8B02 CP4 557-2323
217 Motor control, horology, electrical music tone generation, prime-mover synamo plants, electrical elevator controls Joseph Truhe rm. 9E16 CP4 557-7671
220/290 Utility and Design Applications rm. 10D19 CP4 557-2895
Director Kenneth L. Cage rm. 10D17 CP4 557-2877
Secretary Diana J. Langer rm. 10D17 CP4 557-2877
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Licensing and Review Cecelia Krider rm. 10C24 CP4 557-4948
221 Weapons (firearms, ordnance, ammunition, explosive devices), general lubrication, nuclear reactor systems, illumination, aeronautics and ships as well as all classified mechanical applications Richard E. Schafer rm. 10D27 CP4 ... 557-3253
222 Radio, optic, acoustic, wave communications systems and all classified electri-

cal applications Maynard R. Wilbur rm. 10E04 CP4 557-4923
223 Chemical and including radioactive materials, powder metallurgy, rocket fuels, explosives and thermal and photoelectric batteries as well as all classified chemical applications Benjamin R. Padgett rm. 10B30 CP4 557-4934
291 Ornamental designs in the area of industrial arts Wallace R. Burke rm. 10B04 CP4 557-4079
292 Ornamental designs for fine arts Bernard Ansher rm. 10D03 CP4 557-4965
230 Information Processing, Storage, and Retrieval rm. 11C17 CP4 557-2878
Director Earl Levy rm. 11D37 CP4 ... 557-5088
Secretary Laura Dorsey rm. 11D37 CP4 557-5088
Clerk Katherine A. Nelson rm. 11C17 CP4 557-4174
232 General and special purpose data processing systems and digital arithmetic subsystems James D. Thomas rm. 11B02 CP4 557-0375
233 Static information storage, and retrieval, structural elements of dynamic magnetic information storage or retrieval and record controlled systems Stuart N. Hecker rm. 11D01 CP4 557-0326
234 Ordnance or weapon system computers, code converters and special applications of computers including vehicle control, navigation, measuring, testing and monitoring Errol A. Krass rm. 11B18 CP4 557-8055
235 Electrical dynamic information storage and retrieval Bernard Konick rm. 11D19 CP4 557-4316
236 Computer control systems, miscellaneous applications of computers, computer aided product manufacturing, robotics, analog and hybrid computers, and error correction and detection systems Jerry Smith rm. 11E10 CP4 557-8041
237 General and special purpose data processing systems, and speech analysis and speech analysis and synthesis Gareth D. Shaw rm. 11B40 CP4 557-8047
240 Receptacles, Cleaning, Winding and Measuring rm. 7C17 CP4 557-2900
Director Gerald M. Forlenza rm. 7D19 CP4 557-2906
Secretary Deborah P. Leeper rm. 7D19 CP4 557-2906
Clerk Doretha A. Bailey rm. 7D23 CP4 557-4319
241 Packaging art including glass, fabric metal, wood, paper and plastic receptacles plus closures, therefor William I. Price rm. 6B02 CP4 557-4719
242 Fluid treating, presses, food apparatus, cleaning, agitating, centrifuges, and web feeding Harvey C. Hornsby rm. 7A15 CP4 557-4317
243 Conduits, bathroom facilities, cleaning apparatus, filling apparatus, switches, and article carriers Stephen Marcus rm. 6B21 CP4 557-4156
245 Textiles, winding and reeling, pushing and pulling, bearings, and flexible torque transmitters Stuart S. Levy rm. 7E16 CP4 557-3453
246 Measuring and testing, dynamic information storage or retrieval, optical image projectors and joint packing Charles E. Frankfort rm. 6D15 CP4 557-3220
247 Textile and leather manufacture, apparel, and textiles Werner Schroeder rm. 6D01 CP4 557-3302
250 Electronic and Optical Systems and Devices rm. 8D17 CP4 557-3311
Director Samuel S. Matthews rm. 8D19 CP4 557-2084
Secretary Maclovia E. Sanchez rm. 8D19 CP4 557-2084
Clerk JoAnn Davis rm. 8C19 CP4 557-4784
251 Lasers, fiber optic devices and antennas William L. Sikes rm. 8E04 CP4 557-2734
252 Electronic modulators, demodulators, oscillators, amplifiers, tuners and wave transmission lines and networks Eugene R. Laroche rm. 7B18 CP4 557-4826
253 Semiconductor devices Andrew J. James rm. 7B02 CP4 557-4835
254 Semiconductor and vacuum tube circuits and systems and electronic and electromechanical counting circuits and systems Stanley D. Miller rm. 7B40 CP4 .. 557-4752
255 Optical measuring and testing systems and photocell circuits Davis L. Willis rm. 8D13 CP4 557-4345
256 Radiant energy systems Alfred E. Smith rm. 8B40 CP4 557-4802
257 Optical systems and elements and vision testing and correcting John K. Corbin rm. 8D33 CP4 557-3083
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261 Telegraphy, telephony and audio systems Gene Z. Rubinson rm. 5B02 CP4 . 557-6868
262 Television and television facsimile John C. Martin rm. 5B16 CP4 557-6860
263 Multiplex communications, digital communications and telecommunications Robert L. Griffin rm. 5E02 CP4 557-1139
264 Electrical communications and acoustic wave systems John W. Caldwell rm. 5E16 CP4 557-3356
265 Measuring and testing of non-electrical phenomena Gerald Goldberg rm. 6E02 CP4 557-6116
266 Lamp and discharge devices/systems and image analysis David K. Moore rm. 5D01 CP4 557-6878
267 Measuring and testing of electrical phenomena Michael J. Lynch rm. 5D03 CP4 557-6879
268 Condition responsive communications, measuring and testing James L. Rowland rm. 6E14 CP4 557-9894

MECHANICAL EXAMINING GROUPS

310 Handing and Transporting Media rm. 5D17 CP3 557-3618
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Secretary Betty Rasmussen rm. 5D19 CP3 557-3677
Clerk Margaret Stevens rm. 5D17 CP3 557-3618
311 Dispensing, article dispensing, coin handling, check-controlled apparatus and elevators Joseph J. Rolla, Jr. rm. 5A01 CP3 557-6765
312 Railways and railway equipment, motor vehicle wheels and bodies and article assorting Robert B. Reeves rm. 4D17 CP3 557-3003
313 Handling implements, fluid conveying and spraying and fire extinguishers John J. Love rm. 5D01 CP3 557-3680
314 Brakes, fluid pressure brake systems, spring devices and sheet feeding or delivering devices Bruce H. Stoner, Jr. rm.

5B18 CP3 557-6746
315 Aeronautics and marine arts Trygve M. Blix rm. 6A01 CP3 557-1471
316 Land and motor vehicles Joseph F. Peters, Jr. rm. 5E02 CP3 557-6738
317 Article handling and conveyors and dumping vehicles Robert J. Spar rm. 5D35 CP3 557-6732
320 Material Shaping, Article Manufacturing and Tools rm. 6C17 CP3 557-3694
Director Samih N. Zaharna rm. 6D19 CP3 557-3547
Secretary Anne A. Willey rm. 6D19 CP3 557-3547
Clerk Vera Thomas rm. 6C17 CP3 557-3694
321 Metal deforming, turning and woodworking Francis S. Husar rm. 6E02 CP3 557-6039
322 Electrical connectors, gear cutting, milling and chucks Gil Weidenfield rm. 6D35 CP3 557-3698
323 Abrading, workholders, and tools Frederick Schmidt rm. 7D35 CP3 557-6506
324 Cutting, cutlery tools and miscellaneous hardware Robert Kazenske rm. 6B18 CP3 557-6064
325 Metal founding, fishing, vermin trapping and welding Nicholas Godici rm. 7D01 CP3 557-6513
326 Metal working, comminution and wire working Howard Goldberg rm. 7D17 CP3 557-6520
327 Packaging, bookmaking, butchering, and printed matter Robert Sprull rm. 6D01 CP3 557-6491
330 Mechanical Technologies and Husbandry Person Treatment Information rm. 4C17 CP4 557-3125
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Secretary Theresa R. Godfrey rm. 4D19 CP4 557-3164
Clerk Clara S. Desmukes rm. 4D13 CP4 557-3125
331 Plants, plant culture, toys, earth working or jewelry Robert Hafer rm. 3A01 CP3 557-3131
332 Tobacco, toiletry, or exercising devices Richard Apley rm. 4E16 CP4 557-3131
333 Dentistry, animal husbandry, harvesting and sign exhibiting or back protection devices Louis Mancene rm. 4D01 CP4 ... 557-3131
334 Amusement games or educational devices Richard Pinkham rm. 4B02 CP4 . 557-3131
335 Surgery diagnostic Kyle Howell rm. 4E02 CP4 557-3131
336 Surgery instruments, medicators or receptors C. Fred Rosenbaum rm. 4B22 CP4 557-3131
337 Printing, typewriting or excavating Edgar Burr rm. 3D01 CP3 557-3131
340 Solar, Heat, Power and Fluid Engineering Devices rm. 3C17 CP4 557-3128
Director Donley J. Stocking rm. 3D19 CP4 557-3340
Secretary Sherry K. Bratlie rm. 3D19 CP4 557-3340
Clerk Mary M. Reed rm. 3C17 CP4 ... 557-3122
341 Expansible chamber motors and fluid power systems Robert Garrett rm. 3B22 CP4 557-3464
342 Internal combustion engines including charge forming and ignition systems Charles Myhre rm. 2D01 CP4 557-5690
343 Combustion power plants, reaction meters, pumps, rotary expansible chamber devices Carlton R. Croyle rm. 3B02 CP4 557-0398
344 Environmental control, including heating, air conditioning, refrigeration and ventilation Albert Makay rm. 3D01 CP4 557-0397
345 Combustion of fuels and substances, heating the environment and extracting heat from sun Samuel Scott rm. 3E02 CP4 557-3467
346 Devices and methods for transferring heat from one material to another, turbochargers, superchargers, poppet valve operation and exhaust gas treatment for internal combustion engines, rotary internal combustion engines and powerplant of the type using natural heat William Cline r CP4 557-5679
347 Fluid handling which includes valves, pressure regulators and flow controllers for liquids and gases Martin Schwadron rm. 3D41 CP4 557-6777
350 General Constructions, Petroleum and Mining Engineering rm. 3C17 CP3 557-6200
Director Al Lawrence Smith rm. 3D17 CP3 557-3414
Secretary Carol M. Sinclair rm. 3D19 CP3 557-3414
Clerk Joyce G. Hill rm. 3D13 CP3 ... 557-6200
351 Joints and connections, pipe couplings, fences, earth & hydraulic engineering Cornelius J. Husar rm. 4D01 CP3 557-6200
352 Gearing, power transmissions, clutches, machine elements Leslie A. Braun rm. 3E16 CP3 557-6200
354 Building structures and components Donald G. Kelly rm. 3D21 CP3 557-6200
355 Supports, racks, fire escapes, ladders, scaffolds, flexible partitions Ramon S. Britts rm. 4E02 CP3 557-6200
356 Petroleum, mining, highway and bridge engineering, well drilling, and endless belts James A. Leppink rm. 4D35 CP3 . 557-6200
357 Tables, chairs, cabinets, windows, doors, buckles, buttons, clasps William E. Lyddane rm. 4A01 CP3 557-6200
358 Fasteners, safes, locks, closure fasteners, beds, control levers and linkages Gary L. Smith rm. 3E02 CP3 557-6200

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Production Control Branch Betty J. Wilson rm. 100 North CM1 557-1071
Computer Operations Branch Louise Hill rm. 100 North CM1 557-1071
ADP Patent Division Raymond R. Rahn rm. 5D05 CP2 557-6332
CM1 Crystal Mall 1, 1911 Jefferson Davis Hwy.
CM2 Crystal Mall 2, 1921 Jefferson Davis Hwy.
CP1 Crystal Plz. 1, 2001 Jefferson Davis Hwy.
CP2 Crystal Plz. 2, 2011 Jefferson Davis Hwy.
CP3 Crystal Plz. 3, 2021 Jefferson Davis Hwy.
CP4 Crystal Plz. 4, 2121 Jefferson Davis Hwy.
CP6 Crystal Plz. 6, 2221 Jefferson Davis Hwy.
CP34 Crystal Plz. 34, 2021 Jefferson Davis Hwy.
CS4 Crystal Sq. 4, 1745 Jefferson Davis Hwy.
CS5 Crystal Sq. 5, 1755 Jefferson Davis Hwy.
CG2, Crystal Gateway 2, 1225 Jefferson Davis Hwy.
EADS 1232 South Eads St.
FERN 1411 South Fern St.
HCHB Herbert C. Hoover Bldg., 14th & Constitution Ave., N.W.

Cumulative Directory of Changes as of Oct. 11, 1984

Org.	*Name*	*New Room*	*New Phone*
110	Receptionist	CP03-09C17	557-2517
120	Receptionist	CP02-09C13	557-3920
130	Receptionist	CP03-08C17	557-2475
150	Receptionist	CP02-11C19	557-6525
210	Receptionist	CP04-09C17	557-5080
220	Receptionist	CP04-10C17	557-2478
230	Receptionist	CP04-11C17	557-2878
240	Receptionist	CP04-07C17	557-2900
250	Receptionist	CP04-08C17	557-3311
260	Receptionist	CP04-05C17	557-3321
290	Receptionist	CP04-10C17	557-2863
310	Receptionist	CP03-05C17	557-3618
320	Receptionist	CP03-06C17	557-3694
330	Receptionist	CP04-04C17	557-3125
350	Receptionist	CP03-04C17	557-6200
312	Abate Mark	CP03-04D12	557-3618
327	Abercrombie W.G. . . .	CP03-06D07	557-6494
322	Abrams Neil	CP03-06D21	557-3689
125	Abramson Freda L. . . .	CP02-08A01	557-3920
211	Adams Russell E. . . .	CP04-09B26	557-4873
136	Adee John W.	CP03-08B30	557-2475
330	Aegerter Richard E. . .	CP04-04D19	557-3164
157	Albrecht Dennis	CP02-10A18	557-6525
213	Albritton Clarence L. .	CP04-09A07	557-4859
235	Aldous Alan	CP04-11D08	557-4995
317	Alexander Daniel R. . .	CP03-04D27	557-3618
133	Alvo M. Steven.	CP03-07B26	557-2475
113	Alway Robert M.	CP03-09B15	557-2517
254	Anagnos Larry N. . . .	CP04-07B34	557-4775
133	Anderson Andrew	CP03-07B07	557-2475
256	Anderson Bruce	CP04-08B36	557-4804
345	Anderson Gerald A. . .	CP04-03B34	557-6799
153	Anderson Harold	CP02-10B14	557-6525
137	Anderson Philip E. . . .	CP03-08A13	557-2475
291	Anderson Ruth M. . . .	CP04-10C07	557-4163
216	Andrews George E. R.	CP04-08C03	557-4788
111	Andrews Melvyn J. . . .	CP03-10B36	557-6721
112	Andrews Richard L. . .	CP03-09B24	557-2517
352	Andrews Stephen B. . .	CP03-03E06	557-6200
234	Angotti Donna	CP04-11B28	557-8061
292	Ansher Bernard	CP04-10D03	557-4965
A/C	Antonakas Manuel A . .	CP03-10A15	557-8384
332	Apley Richard	CP04-04E16	557-3125
326	Arbes Carl	CP03-07D29	557-6509
342	Argenbright Tony M. .	CP04-02D11	557-5701
257	Arnold Bruce Y.	CP04-08D27	557-2914
351	Arola Dave W.	CP03-04A13	557-6200
OPP	Arrington Carolyn S. . .	CP03-10B08	557-9184
243	Artis Henry K.	CP04-06B20	557-4728
357	Aschenbrenner Peter A.	CP03-04A03	557-6200
215	Askin Laramie	CP04-09D27	557-4846
236	Atkinson Charles E. . . .	CP04-11E12	557-8016
154	Atkinson William	CP02-11E15	557-6525
212	Ault Anita M.	CP04-09B04	557-4868
322	Austin Paula A.	CP03-06D23	557-6025
114	Auyang Hunter L.	CP03-10E08	557-6726
315	Avila Stephen P.	CP03-06A09	557-3618
155	Babajko Suzanne	CP02-10E05	557-6525
Pet	Babington Karen D. . . .	CP03-11B08	557-4282
331	Bagwill Robert	CP03-03B02	557-3125
332	Bahr Robert	CP04-04D25	557-3125
240	Bailey Doretha	CP04-07C17	557-4319
342	Bailey R. S.	CP04-02B20	557-5700
267	Baker Stephen M. . . .	CP04-05D27	557-3321
131	Ball Michael W.	CP03-07B02	557-2475
315	Barefoot Galen L. . . .	CP03-06B02	557-3618
314	Barlow James E.	CP03-05B20	557-3618
266	Baron John R.	CP04-04A15	557-3321
157	Barr Josephine	CP02-10B02	557-6525
222	Barron Gilberto Jr. . . .	CP04-09B14	557-4866
213	Bartis Anthony	CP04-09D03	557-2356
311	Bartuska Francis J. . . .	CP03-05B08	557-3618
315	Bartz Clifford T.	CP03-06C07	557-3618
133	Bascomb Wilbur L. . . .	CP03-07B36	557-2475
133	Bashore S. Leon	CP03-07E02	557-2475
315	Basinger Sherman D. . .	CP03-06A03	557-3618
325	Batten Reed J.	CP03-07D09	557-6524
332	Beaucage Gregory	CP04-04C33	557-3125
152	Beck Shrive	CP02-11A12	557-6525
315	Bednar Paul J.	CP03-06C05	557-3618
352	Bednarek Michael D. . .	CP03-03E08	557-6200
212	Beha William	CP04-09A05	557-5052
221	Behrend Harvey E. . . .	CP04-10D35	557-4912
243	Bell Houston S. Jr. . . .	CP04-06B28	557-4732
354	Bell J. Karl	CP03-03D29	557-6200
154	Bell James	CP02-11D23	557-6525
152	Bell Janyce	CP02-11B08	557-6525
118	Bell Mark L.	CP03-09B36	557-2517
327	Bell Paul A.	CP03-06D03	557-6492
312	Beltran Howard	CP03-04D13	557-3618
344	Bennett Henry	CP04-03D03	557-6819
122	Benson Robert	CP02-08B30	557-3920
221	Bently Stephen C.	CP04-10D25	557-3869
122	Berch Mark L.	CP02-08B24	557-3920
325	Berg Kenneth F.	CP03-07D10	557-9677
217	Bergmann Saul M.	CP04-09E04	557-4877
256	Berman Jack I.	CP04-08B32	557-4807
134	Bernstein Hiram H. . . .	CP03-09B06	557-2475
254	Bertelson David R. . . .	CP04-07C33	557-4762
316	Bertsch Richard A. . . .	CP03-05E08	557-3618
322	Bilinsky Zenon R.	CP03-06E16	557-3729
357	Binder Mark W.	CP03-04B13	557-6200
265	Birmiel Howard A. . . .	CP04-06E06	557-9889
322	Bishop Steven C.	CP03-06D25	557-1953
121	Bjorkman Dale	CP02-09D13	557-3920

234	Black Thomas G.	CP04–11B30	557–8064
210	Blake Charles B.	CP04–09C30	557–7405
151	Bleutge John	CP02–10D02	557–6525
315	Blix Trygve M.	CP03–06A01	557–3618
222	Blum Theodore M.	CP04–10E06	557–4922
112	Boggs Bruce J. Jr.	CP03–09B18	557–2517
131	Bokan Thomas E.	CP03–07A09	557–2475
131	Boland Lois E.	CP03–07A15	557–2475
311	Bollinger David	CP03–05A03	557–3618
352	Bonck Rodney H.	CP03–04B14	557–6200
129	Bond Robert T.	CP02–09B12	557–3920
135	Bond William J.	CP03–08E06	557–2475
263	Bookbinder Marc E.	CP04–05B38	557–6847
124	Boska Joseph A.	CP02–08E14	557–3920
266	Boudreau Leo H.	CP04–05A13	557–6876
257	Bovernick Rodney	CP04–08D31	557–3178
156	Bowers Charles	CP02–11E04	557–6525
235	Bowler Alyssa	CP04–11D08	557–5953
345	Bowman Brian	CP04–03E10	557–6793
133	Boyer Michael K.	CP03–07B34	557–2475
261	Brady Wade J.	CP04–05B08	557–6865
315	Brahan Thomas J.	CP03–06A09	557–3618
156	Brammer Jack	CP02–11E12	557–6525
340	Bratlie Sherry	CP04–03D19	557–3340
332	Bratlie Steven	CP04–04D33	557–3125
215	Braun Fred L.	CP04–09B36	557–2905
352	Braun Leslie A.	CP03–03E16	557–6200
321	Bray Waymond D.	CP03–06B28	557–6046
264	Brier Jeffrey A.	CP04–05D30	557–3321
264	Brigance Gerald L.	CP04–05D35	557–0452
151	Briggs Wilbert J.	CP02–10E14	557–6525
322	Briggs William R.	CP03–06E12	557–6033
261	Brinich Stephen	CP04–05B11	557–3321
121	Briscoe Kurt G.	CP02–09D15	557–3920
357	Brittain James R.	CP03–04A07	557–6200
262	Britton Howard W.	CP04–05B24	557–6856
355	Britts Ramon S.	CP03–04E02	557–6200
111	Brody Christopher W.	CP03–10B18	557–5145
223	Brookes Anne E.	CP04–10B24	557–4937
216	Broome Harold	CP04–08A03	557-2735
255	Brophy J. Jon	CP04–08D01	557–4340
211	Brown Brian W.	CP04–09B20	557–4869
221	Brown David H.	CP04–10E12	557–4919
332	Brown David	CP04–04D27	557–3125
156	Brown J. Travis	CP02–11E08	557–6525
123	Brown Johnnie R.	CP02–08D05	557–3920
155	Brown Nan	CP02–11C05	557–6525
357	Brown Peter R.	CP03–04C07	557–6200
334	Brown Scott L.	CP04–04B10	557–3125
334	Brown Theatrice	CP04–04A03	557–3125
261	Brown Thomas W.	CP04–05B04	557–6867
234	Brown Winfield J. Jr.	CP04–11B25	557–8005
332	Browne William	CP04–04D37	557–3125
121	Brust Joseph Paul	CP02–09A15	557–3920
243	Bryant James E. III	CP04–06B24	557–4730
317	Bucci David A.	CP03–05D27	557–3618
121	Bucci Patricia A.	CP02–09D13	557–3920
222	Buczinski Stephen C.	CP04–10E10	557–4920
212	Budd Mark	CP04–09B06	557–4862
152	Bueker Richard	CP02–11B04	557–6525
154	Buffalow Edith	CP02–11D12	557–6525
356	Bui Thuy M.	CP03–04E06	557–6200
291	Bullock Barbara J.	CP04–10D01	557–4966
291	Burke Wallace R.	CP04–10B04	557–4979
337	Burr Edgar S.	CP03–03D01	557–3125
326	Burtch John	CP03–07D10	557–6486
153	Bush Lillian	CP02–10A21	557–6525
314	Butler Douglas C.	CP03–05B26	557–3618
261	Byrd Danita R.	CP04–05B11	557–6835
220	Cage Kenneth L.	CP04–10D17	557–2877
116	Caldarola Glenn A.	CP03–09D25	557–6687
264	Caldwell John W.	CP04–05E16	557–3356
351	Callaghan Thomas F.	CP03–04D03	557–6200
254	Callahan Timothy P.	CP04–07E02	557–4753
344	Camby John J.	CP04–03A15	557–6818
OED	Campel Donna P.	CP03–10D23	557–2012
222	Cangialosi Salvator A.	CP04–10B17	557–4960
235	Canney Vincent P.	CP04–11D21	557–8003
332	Cannon Alan	CP04–04D32	557–3125
154	Cannon James	CP02–11D20	557–6525
113	Capella Steven	CP03–09D07	557–6715
344	Capossela Ronald	CP04–03A11	557–6815
235	Cardillo Raymond F. Jr.	CP04–11D13	557–4314
223	Caress Virginia B.	CP04–10E02	557–4924
136	Caroff Marc L.	CP03–07B28	557–2475
217	Carr Roger	CP04–08B13	557–4780
134	Carrier Joseph P.	CP03–09B11	557–2475
151	Carrillo Ana	CP02–10E09	557–6525
253	Carroll James J.	CP04–07A01	557–4834
314	Carroll John A.	CP03–05B16	557–3618
113	Carter Herbert T.	CP03–09D01	557–2517
262	Carter Howard L.	CP04–05B13	557–3321
343	Casaregola Louis J.	CP04–03B08	557–3424
131	Cashion Merrell C.	CP03–07A07	557–2475
121	Cassatt Barbara	CP02–09D15	557–3920
121	Cassatt Barbara	CP02–09D15	557–3920
136	Castel Benoit	CP03–08B34	557–2475
355	Caun Peter M.	CP03–04B32	557–6200
347	Chambers A.	CP04–03D31	557–3409
333	Chamblee Hugh	CP04–04D07	557–3125
237	Chan Eddie P.	CP04–11E04	557–8035
123	Chan Nicky	CP02–08A09	557–3920
265	Chapman John E.	CP04–06E12	557–9893
112	Chapman Terryence F.	CP03–09B20	557–2517
266	Chatmon Saxfield Jr.	CP04–04A05	557–6098
116	Chaudhuri Olik	CP03–09D25	557–6688
357	Chen Jose V.	CP03–04A05	557–6200
313	Cherry Johnny D.	CP03–05D03	557–3618
247	Chi:Kee James	CP04–06D05	557–4334
135	Chiesa Richard L.	CP03–08D31	557–2475
354	Chilcot Richard E. Jr.	CP03–03B13	557–6200
152	Childs Sadie	CP02–11B10	557–6525
234	Chin Gary	CP04–11B16	557–4990
291	Chin Kay H.	CP04–10B06	557–2172
133	Chin Peter	CP03–07B24	557–2475
263	Chin Stephen	CP04–05B32	557–6850
262	Chin Tommy P.	CP04–05B20	557–6858
263	Chin Wellington	CP04–05B26	557–6855
355	Chin-Shue Alvin C.	CP03–04B24	557–6200
355	Chotkowski Karen J.	CP03–04E04	557–6200
245	Christian Leonard D.	CP04–07D31	557–4707
256	Church Craig E.	CP04–08B34	557–4805
265	Ciarlante Anthony V.	CP04–06E08	557–9893
136	Cintins Ivars C.	CP03–08B22	557–2475
232	Clark David L.	CP04–11A01	557–2044
253	Clark Shelia V.	CP04–07A09	557–4828
126	Clarke Vera C.	CP02–09B16	557–3920
253	Clawson Joseph E. Jr.	CP04–07B10	557–4822
346	Cline William	CP04–02B02	557–5679
157	Clingman Lionel	CP02–10A12	557–6525
327	Coan James F.	CP03–06D09	557–6495
153	Cockeram Herbert	CP02–10B22	557–6525
242	Coe Philip R.	CP04–07D07	557–3458
347	Cohan Alan	CP04–03D29	557–3420
341	Cohen Irwin Charles	CP04–03B20	557–3475
335	Cohen Lee S.	CP04–04B34	557–3125
337	Cohen Moshe I.	CP34–03D61	557–3125
136	Cohen Sharon T.	CP03–08E02	557–2475
262	Coles Edward L.	CP04–05B12	557–6863
321	Combs Ervin M.	CP03–06E04	557–6038
333	Contreras Wenceslao	CP04–04A15	557–3125
OPP	Cook Almira J.	CP03–10B10	557–4213
113	Cooper Jack	CP03–09A01	557–2517
331	Coppens Chris J.	CP34–03D63	557–3125
132	Corbin Arthur L.	CP03–08D05	557–2475
351	Corbin David H.	CP03–04A11	557–6200
257	Corbin John	CP04–08D33	557–3083
315	Corl Rodney A.	CP03–06A07	557–3618
221	Cornwell David K.	CP04–10E12	557–4916
246	Corr Denis E.	CP04–06D17	557–4158
292	Corrigan Jane E.	CP04–10A05	557–4974
234	Cosimano Edward R.	CP04–11C28	557–8000
336	Costantino Mario	CP04–04B33	557–3125
337	Coughenour Clyde	CP03–03D05	557–3125
122	Coughlan Paul M. Jr.	CP02–08E06	557–3920
335	Coven Edward	CP04–04B36	557–3125
129	Covington Raymond K.	CP02–09B08	557–3920
342	Cox Ronald B.	CP04–02D09	557–5703

321	Crane Daniel C.	CP03-06B32	557-6043
357	Cranmer Laurie K.	CP03-04A03	557-6200
325	Crosby Gene P.	CP03-07D05	557-1899
268	Crosland Donnie L.	CP04-05E12	557-3359
342	Cross E. Rollins	CP04-02A15	557-5691
332	Crow Stephen	CP04-04D29	557-3125
337	Crowder Clifford D.	CP03-03D03	557-3125
343	Croyle Carlton R.	CP04-03B02	557-0398
342	Cuchlinski William A.	CP04-02D07	557-5702
327	Culver Horace M.	CP03-06D11	557-6496
343	Cuomo Peter M.	CP04-03C04	557-6826
264	Curtis Marshall M.	CP04-05D37	557-1323
243	Cusick Ernest G.	CP04-06B32	557-4734
137	Czaja Donald E.	CP03-08A01	557-2475
332	D'Arrigo Kathleen	CP04-04D32	557-3125
242	Dahlberg Arthur D.	CP04-07D21	557-3932
137	Dailey Patrick M.	CP03-08B09	557-2475
356	Dang Hoang	CP03-04E08	557-6200
122	Daus Donald G.	CP02-08B32	557-3920
251	Davie James W.	CP04-08E06	557-2627
346	Davis Albert W. Jr.	CP04-02B12	557-5684
PET	Davis Angolois	CP03-11C13	557-4282
254	Davis Bernard P.	CP04-07B30	557-4772
116	Davis Curtis R.	CP03-09D29	557-6697
250	Davis Jo Ann	CP04-08C17	557-4784
221	Davis Tyrone	CP04-09B14	557-4866
110	Dawkins Dorothy F.	CP03-09C17	557-2517
131	Dawson Robert A.	CP03-07A05	557-2475
111	Dean Richard O.	CP03-10B20	557-5146
214	Deboer Todd E.	CP04-08B22	557-4907
128	Deck Randy	CP02-08D07	557-3920
116	Dees Carl F.	CP03-09D09	557-2517
156	Dees Jose G.	CP02-11E13	557-6525
EEO	Dees R. Jacquline	CP03-10D17	557-1692
264	Deinde Domnic T.	CP04-05D29	557-3321
134	Delahunty Carol M.	CP03-09B09	557-2475
356	Delsignore Mark J.	CP03-04D33	557-6200
266	Deluca Vincent M.	CP04-04A09	557-6096
266	Demeo Palmer C.	CP04-04A07	557-6097
112	Demers Arthur P.	CP03-09B16	557-6681
237	Demetry Paul	CP04-11B34	557-8061
331	Demille Danton D.	CP03-03B18	557-3125
354	Dennison Caroline	CP03-03B13	557-6200
121	Dentz Bernard I.	CP02-09D17	557-3920
137	Derrington James H.	CP03-08B02	557-2475
EEO	Deskins Charles E.	CP03-10D24	557-1692
322	Desmond Eugene F.	CP03-06D27	557-6027
330	Desmukes Clara S.	CP04-04D13	557-3125
233	Detofsky Steven B.	CP04-11C04	557-8015
316	Diederiks Everett G. Jr.	CP03-05B15	557-3618
314	Diefendorf Richard R.	CP03-05B24	557-3618
352	Diehl Dwight	CP03-04B12	557-6200
129	Dinner Dara L.	CP02-09E05	557-3920
261	Divito Elio	CP04-05B03	557-3321
266	Dixon Harold A.	CP04-04A13	557-6094
118	Dixon William R. Jr.	CP03-09E06	557-6698
241	Dixson William T. Jr.	CP04-06B06	557-4721
217	Dobeck Benjamin	CP04-09D39	557-4166
245	Doigan Lloyd D.	CP04-07D33	557-4322
342	Dolinar Andrew M.	CP04-02A13	557-5693
113	Doll John	CP03-09A15	557-2517
134	Donofrio John	CP03-09B11	557-2475
345	Dority Carroll B. Jr.	CP04-03B40	557-9697
358	Dorner Kenneth	CP03-03B34	557-6200
237	Dorsey Daniel K.	CP04-11B34	557-8066
230	Dorsey Laura	CP04-11D37	557-5088
A/C	Dost Gerald A.	CP03-10D11	557-8384
291	Douglas Alan P.	CP04-10B06	557-6173
112	Douglas Winston A.	CP03-09E02	557-2517
357	Downey Kenneth	CP03-04B04	557-6200
156	Downey Mary	CP02-11B28	557-6525
153	Draper Garnette	CP02-10C05	557-6525
358	Dubnicka Thomas J.	CP03-03B32	557-6200
212	Duggan Donovan	CP04-09B12	557-4865
316	Dukes Mark C.	CP03-05B34	557-3618
217	Duncanson William E. Jr.	CP04-09E12	557-4882
292	Dunkins Bruce W.	CP04-10D09	557-4962
261	Dwyer James L.	CP04-05A05	557-6871
257	Dzierzynski Paul M.	CP04-08E16	557-2884
122	Eakin Mary C.	CP02-08B22	557-3920
346	Ebner David	CP04-02B16	557-5687
326	Echols Percy	CP03-07D25	557-6511
251	Economou Van	CP04-08E02	557-4751
313	Edelbrock Daniel R.	CP03-05D11	557-3618
253	Edlow Martin H.	CP04-07A05	557-4831
267	Edmonds Warren S.	CP04-05D27	557-3088
241	Ehrhardt Brenda J.	CP04-06A03	557-4715
337	Eickholt Eugene H.	CP34-03D51	557-3125
214	Eisenzopf Reinhard J.	CP04-08B10	557-4899
326	Eley Timothy	CP03-07D21	557-6518
241	Elkins Gary E.	CP04-06A01	557-4717
247	Ellis Mary A.	CP04-06A07	557-4327
A/C	Emery Stephan J.	CP03-10D05	557-8384
232	Eng David Y. P.	CP04-11B06	557-2064
214	Envall Roy N. Jr.	CP04-08B18	557-4904
251	Epps Georgia	CP04-08E05	557-4795
156	Epstein Henry	CP02-11B30	557-6525
333	Eskovitz Jay	CP04-04D11	557-3125
216	Evans Arthur G.	CP04-08A13	557-4890
255	Evans F. L.	CP04-08D23	557-3367
213	Evans Geoffrey S.	CP04-09A15	557-4854
126	Evans Joseph	CP02-09B22	557-3920
255	Eyssallenne Ralp	CP04-08D21	557-7619
235	Faber Alan	CP04-11D25	557-2065
131	Falasco Louis	CP03-07A11	557-2475
247	Falik Andrew	CP04-06C07	557-4332
357	Falk Joseph	CP03-04A05	557-6200
335	Falk Steven	CP04-04E10	557-3125
121	Fan Jane T.	CP02-09D11	557-3920
123	Faraci Ciro J.	CP02-08A07	557-3920
222	Farley Richard A.	CP04-10B40	557-4929
344	Favors Edward G.	CP04-03A13	557-6817
291	Fay Horace B. Jr.	CP04-10B02	557-4977
233	Fears Terrell W.	CP04-11D09	557-8072
120	Feducia Linda M.	CP02-09A09	557-3637
292	Feifer Melvin B.	CP04-10D07	557-4963
342	Feinberg Craig R.	CP04-02A05	557-5698
247	Feldbaum Ronald	CP04-06A09	557-9899
242	Feldman Peter	CP04-07D03	557-2917
OED	Feldman William	CP04-10D23	557-2012
137	Fertig Mary Lynn	CP03-08A15	557-2475
331	Feyrer James R.	CP03-03B12	557-3125
241	Fidei David	CP04-06B31	557-4330
256	Fields Carolyn E.	CP04-08B30	557-4808
137	Fischbach Virginia J.	CP03-08A07	557-2475
337	Fisher J. Reed	CP03-03D11	557-3125
136	Fisher Richard V.	CP03-08B3	557-2475
124	Flaherty Elizabeth	CP02-08E13	557-3920
345	Flanigan Allen	CP04-03E06	557-6796
236	Fleming Michael R.	CP04-11D31	557-2876
138	Flint Howard	CP03-08B20	557-2475
215	Flower Terrance L.	CP04-09D09	557-4850
345	Focarino Margaret	CP04-03B32	557-3459
153	Foelak Morton	CP02-10B06	557-6525
128	Foley Shawn P.	CP02-08D23	557-3920
327	Folkerts Michael D.	CP03-06A15	557-3740
245	Footland Lenard A.	CP04-07D34	557-3216
EEO	Ford Henry J.	CP03-10D14	557-1692
346	Ford John K.	CP04-02A01	557-5677
121	Ford John M.	CP02-09D05	557-3920
354	Ford Kathryn	CP03-03D25	557-6200
OED	Ford Marian E.	CP03-10D27	557-1728
240	Forlenza Gerald M.	CP04-07D19	557-2906
313	Forman Michael J.	CP03-05D11	557-3618
138	Fortenberry Jill	CP03-08A15	557-2475
355	Foss J. Franklin	CP03-04B26	557-6200
312	Foster Glenn B.	CP03-04D14	557-3618
241	Foster Jimmy G.	CP04-06A01	557-4718
216	Foster Patrick W.	CP04-08A11	557-4891
128	Foulke C. Lee	CP02-08D07	557-3920
347	Fox John	CP04-03D39	557-6778
246	Frankfort Charles E.	CP04-06D15	557-3220
211	Franklin Lawrence R.	CP04-09D29	557-4847
343	Freeh William L.	CP04-03A07	557-6815
324	Fridie Willmon	CP03-06B24	557-6049
354	Friedman Carl D.	CP03-03D31	557-6200
125	Friedman Stanley J.	CP02-08B08	557-3920

332	Frinks Ronald	CP04-04D35	557-3125
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157	Gaddis Marshall	CP02-11C05	557-6525
358	Gall Lloyd A.	CP03-03B30	557-6200
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127	Gallegos Tom R.	CP02-09E13	557-3920
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291	Gandy James M.	CP04-10A07	557-4973
116	Gantz Delbert E.	CP03-09D35	557-3029
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233	Garcia Alfonso	CP04-11C07	557-4996
235	Garland Steven R.	CP04-11D10	557-8002
126	Garner Vivian	CP02-09B18	557-3920
341	Garrett Robert E.	CP04-03B22	557-3464
138	Garris Bradley R.	CP03-08B06	557-2475
116	Garvin Patrick P.	CP03-09D11	557-2622
257	Gass Rebecca D.	CP04-08D39	557-2886
255	Gatto James	CP04-08A15	557-4339
241	Gehman Bryon P.	CP04-06B31	557-4329
252	Gensler Paul	CP04-07B20	557-4827
261	George Keith E.	CP04-05A09	557-6873
122	Gerstl Robert	CP02-08B26	557-3920
355	Gibson Robert W. Jr.	CP03-04B36	557-6200
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321	Gilden Leon	CP03-06E06	557-6037
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ACP	Gillen Nancy A.	CP03-11B02	557-3054
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214	Ginsburg Morris	CP04-08B20	557-4905
291	Gitlin Suzanne N.	CP04-10D01	557-4967
263	Glenny Raymond C.	CP04-05B28	557-6853
343	Gluck Richard E.	CP04-03B04	557-6810
330	Godfrey Theresa R.	CP04-04D17	557-3164
325	Godici Nicholas P.	CP03-07D01	557-6513
314	Goffney Lawrence J. Jr.	CP03-05B20	557-3618
216	Goldberg Elliot A.	CP04-08B02	557-2323
326	Goldberg Howard	CP03-07D17	557-6520
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268	Goldstein Herbert	CP04-06E04	557-9888
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156	Goodrow John	CP02-11B32	557-6525
356	Goodwin Michael	CP03-04E12	557-6200
326	Gorski Joseph	CP03-07D12	557-6487
233	Gossage Glenn	CP04-11C03	557-4998
335	Graczyk Carol	CP04-04E12	557-3125
150	Graham Sharon	CP02-11A04	557-6525
247	Graveline Tracy	CP04-06A07	557-4713
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310	Gray Bobby R.	CP03-05D17	557-3677
126	Gray Bruce D.	CP02-09E05	557-3920
211	Gray David	CP04-09B28	557-4874
124	Greason Carolyn	CP02-08E11	557-3920
OPP	Green June D.	CP03-10B06	557-9183
345	Green Randall	CP04-03B28	557-6802
263	Greer Timonthy K.	CP04-05B28	557-6854
334	Grieb William H.	CP04-04B08	557-3125
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155	Griffin Ronald W.	CP02-10E04	557-6525
221	Griffiths John E.	CP04-10D21	557-2038
256	Grigsby Thomas N.	CP04-08B38	557-4803
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223	Gron Teddy S.	CP04-10B34	557-4932
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236	Grossman Jon	CP04-11D34	557-8024
358	Grosz Alexander	CP03-03E04	557-6200
234	Gruber Felix D.	CP04-11B14	557-4989
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223	Guynn Herbert B.	CP04-10B20	557-4941
134	Gzybowski Michael S.	CP03-09B04	557-2475
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135	Hart Charles N.	CP03-08E16	557-2475
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267	Harvey Jack B.	CP04-05C05	557-3321
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126	Helfin Bernard	CP02-09B30	557-3920
291	Helflin Claire	CP04-10C07	557-4164
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122	Hendricks Glenna M.	CP02-08B28	557-3920
126	Hendriksen Leah	CP02-09B24	557-3920
253	Henn Teresa	CP04-07C08	557-4840
257	Henry Jon W.	CP04-08D37	557-2393
347	Hepperle Stephen	CP04-03E14	557-6791
128	Herald William	CP02-08D21	557-3920
154	Herbert Thomas	CP02-11E14	557-6525
234	Herndon Heather	CP04-11B27	557-8001
352	Herrmann Allan D.	CP03-03E12	557-6200
292	Herrmann Winifred E.	CP04-10D11	557-4961
341	Hershkovitz Abraham	CP04-03B16	557-3465
154	Hess Bruce	CP02-11D18	557-6525
114	Hey David A.	CP03-10E10	557-6727
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327	Heyrana Paul M.	CP03-06D13	557-1954
212	Hickey Robert	CP04-09B10	557-4864
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316	Hill Mitchell J.	CP03-05B30	557-3618
134	Hill Robert J. Jr.	CP03-09B04	557-2475
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124	Hines Robert V.	CP02-09A03	557-3920
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356	Hjorth Beverly E.	CP03-04E10	557-6200
138	Hoag Willard E.	CP03-08B04	557-2475
131	Hoch Ramon R.	CP03-07A03	557-2475
152	Hoffman James	CP02-11D26	557-6525
268	Hofsass Jeffrey A.	CP04-06B37	557-3321
153	Hoke Veronica	CP02-10B10	557-6525
358	Holko Thomas J.	CP03-03B26	557-6200
129	Hollrah Glennon H.	CP02-09A01	557-3920
317	Holmes Jonathan	CP03-05D33	557-3618

292	Holtje Nelson C.	CP04–10D05	557–4964
214	Hong Choe	CP04–08B09	557–4897
242	Hornsby Harvey C.	CP04–07A15	557–4317
352	House David D.	CP03–04B18	557–6200
138	Housel James C.	CP03–08C07	557–2475
118	Howard Jacqueline V.	CP[illegible]–09E12	557–2517
322	Howell Daniel W.	CP03–06D23	557–1952
256	Howell Janice A.	CP04–08B28	557–4809
335	Howell Kyle	CP04–04E02	557–3125
136	Hruskoci Peter A.	CP03–08B24	557–2475
312	Hubbuch David F.	CP03–04D11	557–3618
222	Hubler Malcolm F.	CP04–10C17	557–4210
254	Hudspeth David R.	CP04–07B32	557–4773
127	Huleatt Jayme	CP02–09E12	557–3920
223	Hunt Brooks H.	CP04–10C17	557–6163
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132	Hunter Jeanette M.	CP03–08D07	557–2475
311	Huppert Michael S.	CP03–05A07	557–3618
351	Husar Cornelius J.	CP03–04D01	557–6200
321	Husar Francis	CP03–06E02	557–6039
341	Husar John M.	CP04–03B31	557–6806
346	Husar Stephen F.	CP04–02A03	557–5676
358	Illich Russell W.	CP03–03B28	557–6200
217	IP Paul	CP04–09E06	557–4878
332	Isabella David	CP04–04D39	557–3125
217	Isen Forester W.	CP04–09D37	557–9694
222	Issing Gregory C.	CP04–10E02	557–4925
126	Ivan John J.	CP02–09B28	557–SULL
154	Ives Patricia	CP02–11D22	557–6525
155	Ivy Warren	CP02–10B32	557–6525
236	Jablon Clark A.	CP04–11E14	557–8018
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253	Jackson Jerome Jr.	CP04–07A03	557–4832
151	Jacobs Lewis	CP02–10D06	557–6525
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245	Jaekel Katherine	CP04–07E08	557–4325
253	James Andrew J.	CP04–07B02	557–4835
247	Jaudon Henry S.	CP04–06D11	557–3206
335	Jaworski Francis	CP04–04E04	557–3125
242	Jenkins Robert W.	CP04–07D11	557–1379
214	Jennings Derek S.	CP04–08B11	557–4781
121	Jiles Henry R.	CP02–09D01	557–3920
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154	Johnson Beverly K.	CP02–11D10	557–6525
355	Johnson Blair M.	CP03–04B30	557–6200
137	Johnson Carolyn E.	CP03–08B11	557–2475
118	Johnson Catherine	CP03–09D34	557–6684
116	Johnson Lance G.	CP03–09D27	557–6690
315	Johnson Raymond B.	CP03–05A11	557–3618
331	Johnson Richard J.	CP03–03B08	557–3125
134	Johnson William R.	CP03–09B07	557–2475
311	Jones Andrew	CP03–05C03	557–3618
321	Jones David B.	CP03–06B26	557–3743
323	Jones James L. Jr.	CP03–07E14	557–6504
212	Jones Judson	CP04–09B28	557–4874
345	Jones Larry	CP04–03B36	557–3469
151	Jones Lucy R.	CP02–10A21	557–6525
313	Jones Marybeth O.	CP03–05A15	557–3618
132	Jones Raymond N.	CP03–08D01	557–2475
136	Jones William G.	CP03–08E04	557–2475
221	Jordan Charles T.	CP04–10D33	557–4911
325	Jordan Mervin L.	CP03–07D11	557–6523
OED	Jordan Patricia M.	CP03–10D25	557–1729
344	Joyce Harold	CP04–03D07	557–0900
336	Kaechele Karen	CP04–04B33	557–3125
222	Kaiser Kenneth R.	CP04–10B12	557–5958
114	Kalafut Stephen J.	CP03–10E08	557–6725
345	Kamen Noah	CP04–03E04	557–6797
335	Kamm William	CP04–04B40	557–3125
216	Kampe Frederick L.	CP04–08C07	557–4876
357	Kannan Philip C.	CP03–04B08	557–6200
112	Kaplan Gerald L.	CP03–09B34	557–2517
122	Kapner Stephen M.	CP02–08B22	557–3920
341	Kapsalas George	CP04–03B31	557–6806
267	Karlsen Ernest F.	CP04–05D25	557–2773
DAC	Karn Darla	CP03–11A09	557–4279
336	Kartchner Gene	CP04–04B16	557–3125
313	Kashnikow Andres	CP03–05D05	557–3618
111	Kastler Scott R.	CP03–10B30	557–3580
351	Katz Eric S.	CP03–04C05	557–6200
321	Katz Steve	CP03–06B24	557–6048
324	Kazenske E. R.	CP03–06B18	557–6064
217	Keane Patrick C.	CP04–09C35	557–4887
321	Kearns Jerry T.	CP03–06E10	557–6035
133	Kellogg Arthur D.	CP03–07B16	557–2475
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354	Kelly Donald G.	CP03–03D21	557–6200
237	Kemeny E. S. Matt	CP04–11E08	557–8053
291	Kemper Catherine E.	CP04–10A01	557–4976
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128	Keplinger Esther	CP02–08D17	557–3920
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243	Kidorf Renee S.	CP04–06B30	557–4328
153	Kight John	CP02–10A22	557–6525
223	Kilby Catherine S.	CP04–10B22	557–4940
125	Kilcoyne John M.	CP02–08B04	557–3920
233	Kilgore Robert M.	CP04–11A15	557–2871
126	Killos Paul	CP02–09E04	557–3920
317	Kim Lyle	CP03–05D33	557–3618
131	Kimlin Edward C.	CP03–07A01	557–2475
132	King Elizabeth A.	CP03–08D25	557–2475
344	King Lloyd L.	CP04–03D21	557–6113
356	Kisliuk Bruce M.	CP03–04D33	557–6200
156	Kittle John	CP02–11E02	557–6525
221	Klein Richard L.	CP04–10E16	557–4915
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322	Kline Thomas M.	CP03–06E10	557–6034
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324	Knoble John L.	CP03–06B20	557–6052
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151	Koeckert Arthur	CP02–10E11	557–6525
235	Konick Bernard	CP04–11D17	557–4316
116	Konopka Paul E.	CP03–09D21	557–6685
255	Koren Matthew W.	CP04–08D25	557–4346
262	Kostak Victor R.	CP04–05B14	557–6862
264	Kovalick Vincent P.	CP04–05E14	557–3357
215	Kozma Thomas J.	CP04–09D23	557–4845
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234	Krass Errol A.	CP04–11B18	557–8055
138	Kratz Peter F.	CP03–08B08	557–2475
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267	Krawczewicz Stanley T.	CP04–05D05	557–6880
265	Kreitman Stephen A.	CP04–05E10	557–3360
317	Krizek Janice L.	CP03–05E12	557–3618
352	Krizmanich George	CP03–04B16	557–6200
336	Kruter Jerome	CP04–04B24	557–3125
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155	Kulkosky Peter	CP02–10B26	557–6525
351	Kundrat Andrew V.	CP03–04D05	557–6200
260	Kunin Stephen G.	CP04–05D19	557–1890
263	Kuntz Curtis A.	CP04–05B37	557–6896
344	Kwon John	CP04–03A03	557–6813
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135	Lacy David L.	CP03–08E10	557–2475
342	Lall Parshotam S.	CP04–02D05	557–5704
253	Lamont John C.	CP04–07B03	557–4818
118	Lander Ferris H.	CP03–09E14	557–2517
113	Langel Wayne A.	CP03–09A11	557–6710
220	Langer Diana J.	CP04–10D19	557–2897
291	Largen James R.	CP04–10B08	557–2173
253	Larkins William D.	CP04–07B06	557–4820
252	LaRoche Eugene R.	CP04–07B18	557–4826
321	Larson Lowell A.	CP03–06B34	557–6042
236	Lastova John R. III	CP04–11D33	557–2875
213	Lateef Marvin M.	CP04–09C03	557–7657
268	Lau Chi K.	CP04–06C35	557–3321
OPP	Lawhorn Marva G.	CP03–10B04	557–9182
152	Lawrence Evan	CP02–11A10	557–6525
334	Layno Benjamin H.	CP04–04B11	557–3125
342	Lazarus Ira S.	CP04–02D03	557–5689
342	Lazarus Ronald H.	CP04–02A07	557–5697
157	Le Hoa	CP02–11C02	557–6525
112	Leader William T.	CP03–09B28	557–2517
A/C	Leavitt Alfred L.	CP03–10D03	557–8384
223	Lechert Stephen J.	CP04–10B36	557–4931

355	Lechok Sarah A.	CP03-04B22	557-6200
134	Ledbetter Titus B. Jr.	CP03-09B09	557-2475
252	Lee Benny T.	CP04-07B26	557-4768
211	Lee Douglas S.	CP04-09B20	557-4870
237	Lee Jameson	CP04-11B38	557-8031
251	Lee John D.	CP04-07E04	557-4756
153	Lee Lester	CP02-10B16	557-6525
232	Lee Thomas	CP04-11C33	557-4999
113	Leeds Jackson	CP03-09A05	557-6717
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114	LeFevour Charles F.	CP03-10E06	557-2517
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256	Lemmo Vincent J.	CP04-08E03	557-4796
356	Leppink James A.	CP03-04D35	557-6200
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213	Leung Philip H.	CP04-09A11	557-4857
261	Lev Robert G.	CP04-05A07	557-6872
230	Levy Earl	CP04-11D37	557-5088
267	Levy Stewart J.	CP04-05D11	557-6883
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114	Schiavelli Alan E.	CP03-10E14	557-3593
156	Schilling Richard	CP02-11B22	557-6525
323	Schmidt Frederick R.	CP03-07D35	557-6506
334	Schneider Matthew L.	CP04-04B11	557-3125
155	Schoffer Joseph	CP02-10E02	557-6525
133	Schor Kenneth M.	CP03-07B30	557-2475
324	Schran Donald R.	CP03-06B06	557-6070
261	Schreyer Stafford D.	CP04-05B06	557-6866
261	Schroeder Larry C.	CP04-05A03	557-6870
247	Schroeder Werner	CP04-06D01	557-3302
355	Schultz William H.	CP03-04B20	557-6200
333	Schulze Kris R.	CP04-04C05	557-3125
246	Schuster David R.	CP04-06D20	557-4159
347	Schwadron Martin	CP04-03D41	557-6777
344	Schwartz Larry I.	CP04-03D11	557-6821
154	Schwartz Pamela	CP02-11D07	557-6525
121	Schwartz Richard A.	CP02-09D09	557-3920
336	Scott Crista	CP04-04E10	557-3125
150	Scott Ellen	CP02-11B14	557-6525
214	Scott James R.	CP04-08B14	557-2768
251	Scott Leon Jr.	CP04-08E08	557-3108
126	Scott Patricia M.	CP02-09B28	557-3920
345	Scott Samuel	CP04-03E02	557-3467
OPP	Scott Susie S.	CP03-10B12	557-4219
263	Scutch Frank M.	CP04-05B30	557-6852
213	Sears Chistopher N.	CP04-09D07	557-4853
223	Sebastian Leland A.	CP04-10B32	557-4933
151	Seccuro Carman	CP02-10D16	557-6525
325	Seidel Richard K.	CP03-07C03	557-3733
156	Seidleck James	CP02-11E09	557-6525
151	Sellers Robert	CP02-10E09	557-6525
133	Sever Frank	CP03-07B20	557-2475
233	Severin David J.	CP04-11C05	557-4997
OPP	Seward Margaret C.	CP03-10B09	557-5149
337	Sewell Paul T.	CP03-03D09	557-3125
156	Shah Mukund	CP02-11B20	557-6525
317	Shane Kyle E.	CP03-04D27	557-3618
257	Shapiro B.	CP04-08D38	557-4812
127	Shapiro Lionel M.	CP02-09E16	557-3920
334	Shapiro Paul E.	CP04-04B04	557-3125
311	Shaver Kevin P.	CP03-05A09	557-3618
124	Shaver Paul F.	CP02-08E10	557-3920
213	Shaw Clifford C.	CP04-09A13	557-4856
232	Shaw Dale M.	CP04-11B08	557-4173
237	Shaw Gareth D.	CP04-11B40	557-8047
335	Shay David	CP04-04E08	557-3125
331	Shay F. Barry	CP03-03B04	557-3125
347	Shay James	CP34-03D49	557-6775
336	Shedd Charles	CP04-04B20	557-3125
111	Sheehan John P.	CP03-10B16	557-5143
335	Shein Mitchell	CP04-04E08	557-3125
122	Shen Cecilia J.	CP02-08E02	557-3920
243	Shepperd John W.	CP04-06B26	557-4731
317	Sheridan Robert G.	CP03-05D31	557-3618
116	Shine William J.	CP03-09D13	557-2621
126	Shippen Michael L.	CP02-09E02	557-3920
241	Shoap Allan N.	CP04-06B10	557-4723
243	Sholl Linda J.	CP04-06B32	557-4735
247	Shongut Steve	CP04-06C03	557-5656
292	Shooman Theodore M.	CP04-10B06	557-4980
212	Shoop William M. Jr.	CP04-09A03	557-5051
151	Short Patricia	CP02-10E16	557-6525
124	Shubin Harry B.	CP02-08E09	557-3920
123	Siegel Alan M.	CP02-08A11	557-3920
317	Siemens Terrance L.	CP03-05D21	557-3618
213	Sigda Catherine	CP04-09C05	557-4885
251	Sikes William L.	CP04-08E04	557-2734

137	Silbaugh Jan H.	CP03–08A05	557–2475
324	Silverberg Fred A.	CP03–06B10	557–6068
152	Silverberg Sam	CP02–11A16	557–6525
154	Silverman Stanley	CP02–11D08	557–6525
343	Simenauer Jeffery A.	CP04–03A01	557–6811
131	Simmons David A.	CP03–07B08	557–2475
242	Simone Timothy F.	CP04–07D13	557–3422
350	Sinclair Carol	CP03–03D19	557–3414
327	Sipos John	CP03–06D05	557–6493
311	Skaggs H. Grant JR.	CP03–05B02	557–3618
114	Skapars Anthony	CP03–10D31	557–3592
111	Skiff Peter K.	CP03–10B28	557–6719
334	Skogquist Harland S.	CP04–04B14	557–3125
212	Skudy Robert	CP04–09B16	557–4867
234	Sloyan Thomas J.	CP04–11B26	557–8060
253	Small Charles S.	CP04–07B04	557–4836
350	Smith Al Laurence	CP03–03D17	557–3414
256	Smith Alfred	CP04–08B40	557–4802
354	Smith Creighton	CP03–03B11	557–6200
217	Smith David	CP04–09E10	557–4881
155	Smith Edward	CP02–10E06	557–6525
358	Smith Gary L.	CP03–03E02	557–6200
323	Smith James G.	CP03–07E10	557–6502
236	Smith Jerry	CP04–11E10	557–8041
152	Smith John	CP02–11A06	557–6525
343	Smith Leonard E.	CP04–03A05	557–6814
246	Smith Randolph	CP04–02B14	557–5685
246	Smith Robert I.	CP04–06D27	557–2922
335	Smith Ruth	CP04–04E12	557–3125
133	Smith William F.	CP03–07B32	557–2475
118	Smith–Harris Y. Mrs.	CP03–09E16	557–2517
124	Sneed Helen M. S.	CP02–08E16	557–3920
267	Snow Walter E.	CP04–05D23	557–2772
245	Sohacki Lynn	CP04–07D25	557–4320
267	Solis Jose M.	CP04–05D07	557–6881
344	Sollecito John M.	CP04–03C03	557–6824
157	Sommer C.	CP02–11D31	557–6525
312	Song Robert R.	CP03–04D23	557–3618
124	Sopp John	CP02–08E09	557–3920
315	Sotelo Jesus D.	CP03–06A05	557–3618
222	Sotomayor John B.	CP04–10E08	557–4918
292	Spangler Robert C.	CP04–10A13	557–4970
317	Spar Robert J.	CP03–05D35	557–3618
134	Spear Frank A.	CP03–08B16	557–2475
135	Spitzer Robert H.	CP03–08E12	557–2475
232	Springborn Harvey E.	CP04–11A03	557–2011
129	Springer David B.	CP02–09B06	557–3920
327	Spruill R. L.	CP03–06D01	557–6491
352	Staab Lawrence	CP03–03E14	557–6200
111	Stallard Wayland W.	CP03–10B34	557–6720
356	Starinsky Michael J.	CP03–04E06	557–6200
347	Starsiak John	CP04–03E12	557–6792
246	Stearns Richard R.	CP04–06D25	557–3200
222	Steinberger Brian S.	CP04–10E08	557–4921
235	Stellar George G.	CP04–11D23	557–4313
246	Stephan Steven L.	CP04–06D19	557–4337
257	Stern Ronald	CP04–08E14	557–3107
212	Sterrett Jeffrey L.	CP04–09B04	557–4861
310	Stevens Margaret W.	CP03–05B14	557–3618
214	Steward Susan A.	CP04–08B26	557–4810
PET	Stewart David L.	CP03–11B04	557–4282
242	Stinson Frankie L.	CP04–07A13	557–8283
340	Stocking Donley	CP04–03D17	557–3400
245	Stodola Daniel P.	CP04–07E12	557–4154
351	Stodola Nancy J.	CP03–04A09	557–6200
334	Stoll Maryann Lastova	CP04–04B09	557–3125
113	Stoll Robert L.	CP03–09D05	557–2517
333	Stone Cary	CP04–04C07	557–3125
123	Stone Jacqueline M.	CP02–08A07	557–3920
317	Stone Michael	CP04–05D34	557–3618
314	Stoner Bruce H. Jr.	CP03–05B18	557–3618
312	Stormer Russell D.	CP03–04D25	557–3618
331	Stouffer Richard T.	CP03–03B10	557–3125
343	Stout Donald E.	CP04–03B12	557–8099
113	Straub Gary P.	CP03–09A07	557–2517
267	Strecker Gerard R.	CP04–05D09	557–6882
327	Studebaker Donald R.	CP03–06A11	557–6073
356	Suchfield George A.	CP03–04E16	557–6200
257	Sugarman Scott J.	CP04–08D35	557–2910
126	Sullivan John J.	CP02–09B28	557–3920
124	Sutto Anton H.	CP02–08D27	557–3920
268	Swann Glen R.	CP04–05E06	557–3374
333	Swiatek Robert	CP04–04D09	557–3125
315	Swinehart Edwin L.	CP03–06C03	557–3618
154	Swisher Nancy	CP02–11D09	557–6525
265	Swisher S. Clement	CP04–06B40	557–9887
335	Sykes Angela	CP04–04E06	557–3125
110	Talbert Dennis E. Jr.	CP03–09D17	557–9600
355	Talbott David L.	CP03–04B11	557–6200
127	Tanenholtz Alvin E.	CP02–09E14	557–3920
344	Tanner Harry	CP04–03D05	557–0901
344	Tapolcai William	CP04–03D09	557–6820
127	Tarcza John E.	CP02–09D23	557–3920
216	Tarcza T. H.	CP04–08A01	557–2736
215	Tarick Basma	CP04–08A11	557–4892
333	Tarnoff David	CP04–04D25	557–3125
245	Taylor Billy S.	CP04–07D37	557–4323
351	Taylor Dennis L.	CP03–04A15	557–6200
253	Telesz Andrew	CP04–07B04	557–4837
122	Teoli William A.	CP02–08E02	557–3920
321	Terrell William E.	CP03–06B30	557–6045
234	Teska Kevin J.	CP04–11B20	557–8056
155	Teskin Fred	CP02–10E03	557–6525
127	Teskin Robin L.	CP02–09E12	557–3920
237	Thaler Melinda	CP04–11C35	557–8021
336	Thaler Michael	CP04–04B26	557–3125
136	Therkorn Ernest G.	CP03–08B28	557–2475
A/C	Thesz J. Michael	CP03–10D09	557–8384
223	Thexton Matthew A.	CP04–10B22	557–4939
154	Thibodeau Paul	CP02–11D06	557–6525
123	Thieman Charles H.	CP02–08A12	557–3920
156	Thomas Alexander	CP02–11B26	557–6525
113	Thomas Earl C.	CP03–09D03	557–3585
232	Thomas James D.	CP04–11B02	557–0375
150	Thomas James O.	CP02–11A02	557–6525
320	Thomas Vera	CP03–06C17	557–3694
214	Thompson Gregory D.	CP04–08B09	557–4782
127	Thompson Rebecca	CP02–09E15	557–3920
255	Thompson Robert	CP04–08D21	557–7619
157	Thompson Willie	CP02–11B16	557–6525
343	Thorpe Timothy S.	CP04–03B12	557–9698
243	Thronson Mark J.	CP04–06B18	557–4727
137	Thurlow Jeffrey R.	CP03–08A03	557–2475
292	Titolo Linda M.	CP04–09D21	557–4844
266	Todd Jacqueline E.	CP04–05A09	557–3321
267	Tokar Michael J.	CP04–05D13	557–6884
214	Tolin Gerald P.	CP04–08B16	557–2767
311	Tollberg Stanley H.	CP03–05B06	557–3618
215	Tone David A.	CP04–09D09	557–4851
233	Trafton David L.	CP04–11A07	557–8070
358	Trettel Michael F.	CP03–03B33	557–6200
126	Trousof Natalie	CP02–09B32	557–3920
247	Troutman Doris	CP04–06A15	557–3310
217	Truhe Joseph	CP04–09E16	557–7671
336	Truluck Dalton	CP04–04B32	557–3125
222	Tubbesing Theodore H.	CP04–10E14	557–4918
221	Tudor Harold J.	CP04–10D29	557–2057
112	Tufariello Thomas M.	CP03–09B22	557–2517
268	Tumm Brian R.	CP04–06E16	557–9895
112	Tung Ta–Hsung	CP03–09B30	557–2517
157	Tungol Maria	CP02–10B04	557–6525
233	Tupper Robert S.	CP04–11D03	557–0329
134	Turk Arnold	CP03–09B08	557–2475
255	Turner Sam	CP04–08A15	557–4339
A/C	Turner Vincent D.	CP03–10D01	557–8384
129	Turnipseed James H.	CP02–09B10	557–3920
251	Ullah Akm E.	CP04–07E09	557–4760
317	Underwood Donald W.	CP03–05D29	557–3618
236	Ungerman Mark E.	CP04–11E14	557–8017
233	Urcia Benjamin E.	CP04–11B05	557–5951
112	Valentine Donald R.	CP03–09B14	557–2517
317	Valenza Joseph E.	CP03–04D29	557–3618
292	Vales Carmen H.	CP04–10A09	557–4972
154	Van Balen William	CP02–11D04	557–6525
120	Van Horn Charles E.	CP02–09A09	557–3637
261	Vass Randall	CP04–05B03	557–3321
336	Vinyard Sherri	CP04–04B18	557–3125
321	Vlachos Leonidas	CP03–06E08	557–6036

255	Vollero Michael	CP04–08D11	557–4344
243	Voorhees David H.	CP04–06B34	557–4736
317	Voorhees Douglas	CP03–04D34	557–3618
343	Vrablik John J.	CP04–03B06	557–6809
312	Wacyra Edward M.	CP03–04D21	557–3618
125	Waddell Frederick E.	CP02–08B10	557–3920
217	Wade Shelly M.	CP04–09C37	557–9693
213	Walberg Teresa J.	CP04–09A15	557–4855
155	Walker Alexander	CP02–10E03	557–6525
EEO	Walker Denise A.	CP03–10D13	557–1692
326	Wallace Ronald	CP03–07D12	557–9678
223	Wallen Thomas J.	CP04–10B28	557–4935
221	Walsh Donald P.	CP04–10D39	557–4914
114	Walton Donald L.	CP03–10E04	557–6723
347	Walton George	CP34–03D47	557–6776
124	Waltz Thomas A.	CP02–08D25	557–3920
252	Wan Gene	CP04–07B24	557–4766
246	Ward Robert S. Jr.	CP04–06D33	557–4157
128	Warden Robert	CP02–08D19	557–3920
344	Warner Steven E.	CP04–03C07	557–6822
124	Warren Charles F.	CP02–08D31	557–3920
215	Warren David S.	CP04–09C36	557–9696
220	Washington Lola E.	CP04–10C23	557–2478
221	Wasil Daniel D.	CP04–10D31	557–4910
245	Watkins Donald E.	CP04–07D29	557–4151
323	Watson Robert C.	CP03–07E12	557–6503
316	Watts Charles R.	CP03–05B15	557–3618
324	Watts Douglas D.	CP03–06B14	557–6066
157	Wax Robert	CP02–10C01	557–6525
344	Wayner William	CP04–03A09	557–1994
347	Weakley Harold	CP04–03D25	557–3473
316	Weaver Ross A.	CP03–05E04	557–3618
241	Weaver Sue A.	CP04–06A03	557–4716
322	Webb Glenn L.	CP03–06D29	557–6028
322	Weidenfeld Gil	CP03–06D35	557–3698
A/C	Weiffenbach Cameron	CP03–10A13	557–8384
327	Weihrouch Steven P.	CP03–06A15	557–6490
132	Weimar Elizabeth J.	CP03–08D23	557–2475
132	Weinstein Steven L.	CP03–08D09	557–2475
333	Weiss John G.	CP04–04D21	557–3125
114	Weisstuch Aaron	CP03–10B26	557–3603
217	Welden Ulysses	CP04–09D35	557–5082
313	Weldon Kevin P.	CP03–05A13	557–3618
156	Welsh John	CP02–11E06	557–6525
153	Welsh Maurice	CP02–10B20	557–6525
221	Wendtland Richard W.	CP04–10E16	557–4917
337	Weresh John A.	CP34–03D55	557–3125
245	Werner David	CP04–07D33	557–3215
317	Werner Frank E.	CP03–05D25	557–3618
255	Westin Edward P.	CP04–08D03	557–4341
138	Weston Caleb	CP03–07B14	557–2475
344	Westphal David W.	CP04–03C05	557–6823
358	Whitcomb Adrian	CP03–03B30	557–6200
130	White Robert F.	CP03–08D19	557–2475
323	Whitehead Harold D.	CP03–07E16	557–6505
121	Whittenbaugh Robert W.	CP02–09D19	557–3920
337	Wiecking David A.	CP34–03D57	557–3125
266	Wieder Kenneth A.	CP04–05A15	557–6877
128	Wieder Stephen	CP02–08D04	557–3920
256	Wieland Charles	CP04–08E02	557–2733
237	Wiens Tim A.	CP04–11E06	557–8036
222	Wilbur Maynard R.	CP04–10E04	557–4923
291	Wilder Lynn D.	CP04–10B02	557–4978
242	Wilhite Billy J.	CP04–07D09	557–6118
246	Will Thomas B.	CP04–06D20	557–4338
320	Willey Anne A.	CP03–06D19	557–3547
232	Williams Archie E. Jr.	CP04–11A05	557–2119
265	Williams Hezron E.	CP04–06E16	557–9896
112	Williams Howard S.	CP03–09B32	557–2517
313	Williams Larry E.	CP03–05D09	557–3618
351	Williams Todd G.	CP03–04A09	557–6200
317	Williamson Dennis J.	CP03–05E14	557–3618
255	Willis Davis L.	CP04–08D13	557–4345
157	Willis Prince	CP02–10A16	557–6525
333	Wilson John J.	CP04–04D23	557–3125
358	Wilson Neill R.	CP03–03B32	557–6200
251	Wimer Michael C.	CP04–08E03	557–4797
211	Wintercorn Richard A.	CP04–09B38	557–4889
234	Wise Edward J.	CP04–11B22	557–8058
251	Wise Robert E.	CP04–08E12	557–2889
127	Wiseman Thomas	CP02–09D31	557–3920
217	Witkowski Stanley J.	CP04–09E08	557–4880
131	Wityshyn Michael G.	CP03–07B04	557–2475
253	Wojciechowicz Edward J.	CP04–07A07	557–4830
324	Wolfe James L.	CP03–06B22	557–6050
358	Wolfe Robert L.	CP03–03B24	557–6200
342	Wolfe Willis R.	CP04–02B18	557–5699
233	Wolff John H.	CP04–11A11	557–0535
155	Hong Harry	CP02–10E10	557–6525
212	Wong Peter	CP04–09B02	557–7857
138	Woo Jay H.	CP03–08B12	557–2475
236	Woo Louis	CP04–11E11	557–8022
138	Woodard Joye L.	CP03–08B14	557–2475
268	Woodiel Donald D.	CP04–06D35	557–9898
291	Word A. Hugo	CP04–10B10	557–2911
292	Word George P.	CP04–10A11	557–4971
246	Worth W. Morris	CP04–06B32	557–4187
352	Wright Dirk	CP03–03E10	557–6200
337	Wright Ernest T.	CP03–03D07	557–3125
116	Wright William G.	CP03–09D23	557–6686
136	Wyse Thomas G.	CP03–08B32	557–2475
157	Yarborgh Amelia	CP02–11B18	557–6525
246	Yasich Daniel M.	CP04–06D31	557–2669
336	Yasko John	CP04–04B28	557–3125
111	Yee Deborah	CP03–10C34	557–6730
132	Yeung George C.	CP03–08D27	557–2475
345	Yeung James	CP04–03B38	557–3468
132	Yoncoskie Robert A.	CP03–08D29	557–2475
324	Yost Frank T.	CP03–06B08	557–6069
331	Yu Mickey	CP03–03B14	557–3125
344	Yuen Henry	CP04–03D23	557–6114
264	Yusko Donald J.	CP04–05D39	557–3355
264	Yuth Hean	CP04–05E14	557–3321
232	Zache Raulfe B.	CP04–11B04	557–2429
320	Zaharna Samih N.	CP03–06D19	557–3547
292	Zarfas Louis S.	CP04–10A15	557–4968
323	Zatarga Joseph T.	CP03–07E06	557–6500
254	Zazworsky John	CP04–07B36	557–4776
151	Ziegler Jacob	CP02–10D12	557–6525
111	Zimmerman John J.	CP03–10B30	557–3580
357	Zugel Francis K.	CP03–04B02	557–6200

PATENT NOTICES

Certificates of Correction for the Week of Nov. 13, 1984

Re. 31,432	4,420,605	4,441,388	4,449,462
D. 273,345	4,421,134	4,441,418	4,449,813
4,000,468	4,422,341	4,441,581	4,450,154
4,134,769	4,423,428	4,441,601	4,450,393
4,172,416	4,426,242	4,441,792	4,450,613
4,244,506	4,428,771	4,442,023	4,451,285
4,264,601	4,431,461	4,444,151	4,451,431
4,278,305	4,431,866	4,444,520	4,451,460
4,302,420	4,433,270	4,444,696	4,453,825
4,320,143	4,433,804	4,444,764	4,454,004
4,325,334	4,434,156	4,444,781	4,454,685
4,337,596	4,434,440	4,444,957	4,454,876
4,341,228	4,434,918	4,445,126	4,455,141
4,343,806	4,435,447	4,445,410	4,455,287
4,368,329	4,438,198	4,445,744	4,455,305
4,371,821	4,438,568	4,445,887	4,455,812
4,385,830	4,438,792	4,446,074	4,456,130
4,393,264	4,439,381	4,446,154	4,457,485
4,399,094	4,439,392	4,446,359	4,457,980
4,405,639	4,439,419	4,446,499	4,458,240
4,406,710	4,440,161	4,447,146	4,459,313
4,408,762	4,440,329	4,447,484	4,459,585
4,411,924	4,440,545	4,447,767	4,459,683
4,413,937	4,440,947	4,448,212	
4,418,205	4,441,236	4,448,389	

GUIDELINES FOR THE SUBMISSION OF APPLICATIONS FOR INTERIM PROTECTION OF MASK WORKS UNDER 17 U.S.C. 914

Chapter 9 of Title 17 of the United States Code, the Semiconductor Chip Protection Act of 1984, establishes a new form of intellectual property protection for mask works that are fixed in semiconductor chips. Mask works are defined as a "series of related images, however fixed or encoded" that represent the three-dimensional patterns in the layers of a semiconductor chip. This chapter provides a 10 year term of protection for original mask works measured from their date of registration on first commercial exploitation anywhere in the world. Mask works must be registered in the United States Copyright Office within two years of first commercial exploitation to maintain this protection.

This chapter denies protection to foreign owners of mask works unless the works are first commercially exploited in the United States. It is contemplated that foreign countries will eventually obtain full protection by concluding treaties or enacting chip protection legislation. In order to encourage steps toward a regime of international comity in mask work protection, Section 914(a) provides that the Secretary of Commerce may extend the privilege of interim protection under the Semiconductor Chip Act to nationals of foreign nations under certain conditions. These are: (1) that the foreign nation in question is making progress (either by treaty negotiation or legislative enactment) toward a regime of mask work protection generally similar to that under the Act; (2) that its nationals and persons controlled by them (such as subsidiaries or affiliated companies) are not engaging and have not in the recent past engaged in chip piracy or the sale of products containing infringing semiconductor components; and (3) that entry of the Secretary's order would promote the purposes of the Act and of achieving international comity toward mask work protection.

This notice establishes initial guidelines that specify the content and procedures for the submission of petitions for the Secretary of Commerce to issue or to terminate an Order extending the privilege of making interim registrations for mask works pursuant to chapter 9 of Title 17 of the United States Code. The Assistant Secretary of Commerce and Commissioner of Patents and Trademarks has been delegated the responsibility to receive petitions, conduct proceedings, make findings, and issue or terminate Orders. These guidelines set forth, in accordance with the statutory provisions, the persons eligible to initiate such proceedings, the procedures to be followed, and the information required to be submitted so that the Commissioner can make the determination required by the statute.

A. DEFINITIONS

As used in these guidelines:

(a) "Commissioner" means the Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.

(b) "Interim registration" means a registration of a mask work with the Register of Copyrights by a foreign national, domiciliary or sovereign authority made pursuant to an Order issued under these guidelines.

(c) "Order" means an action by the Commissioner issuing or terminating an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations for mask works pursuant to Chapter 9 of title 17, U.S.C.

(d) "Petition" means a request that the Commissioner issue or terminate an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations for mask works pursuant to Chapter 9 of title 17, U.S.C.

(e) "Proceeding" means a proceeding to issue or to terminate an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations for mask works pursuant to Chapter 9, of title 17, U.S.C.

(f) "Secretary" means the Secretary of Commerce.

B. EFFECTIVE DATE OF GUIDELINES

These guidelines shall come into force on the date of signature of H.R. 6163 by the President.

C INITIATION OF PROCEEDINGS

(a) The Commissioner may initiate proceedings under these guidelines on his own motion or as directed by the Secretary.

(b) The Commissioner shall initiate proceedings under these guidelines upon receipt of a petition.

D. SUBMISSION OF PETITIONS

(a) Petitions may be submitted at any time, however the effective date of any Order shall not precede the coming into force of Chapter 9 of 17 U.S.C.

(b) Petitions shall be submitted to the Commissioner for review and evaluation.

E. CONTENT OF PETITIONS

(a) Any petition requesting that the Commissioner issue an Order extending the privilege of making interim registration under Chapter 9 of 17 U.S.C. must include:

(1) A statement of the foreign governmental agency in charge of developing legislation or negotiating a treaty for the protection of mask works in a manner generally similar to the provisions of Chapter 9 of 17 U.S.C.: (i) that it is making good-faith efforts and reasonable progress toward developing and enacting such legislation or toward entering into such a treaty, and (ii) providing substantive information regarding the entity in the foreign nation to whom the responsibility has been delegated and the procedures that will be followed including any expected target dates for action.

(2) A statement by the appropriate foreign government or foreign governmental agency, including such supporting evidence as may be available, that neither that nation nor its nationals, domicilaries, sovereign authorities or persons controlled by them are engaged in the misappropriation, or unauthorized distribution or commercial exploitation of mask works.

(3) Information from the party submitting the petition that provides evidence of the progress or the actual efforts undertaken by the foreign nation. Such information should include:

(i) Copies of bills introduced in the foreign legislature;

(ii) Copies of legislative proposals by responsible agencies;

(iii) Records of international proceedings or negotiations showing efforts toward developing an appropriate treaty;

(iv) Reports of governmental or private sector commissions studying and making recommendations on appropriate measures to protect mask works in semiconductor chip products;

(v) Correspondence between private sector organizations and responsible governmental organizations; and

(vi) Any other material including executive proclamations, resolutions or regulations that would support the claim of good-faith efforts and the absence of misappropriations or the absence of unauthorized distribution or commercial exploitation of mask works.

(b) All materials furnished must be in the English language or provided with a certified English translation.

F. PROCEEDING

(a) A proceeding shall be initiated by the publication of a notice in the Federal Register providing interested parties with an opportunity to submit relevant comments.

(b) Based upon comments received or a review of any petition submitted, the Commissioner, at his discretion, may hold a hearing to permit interested parties and the petitioner to present additional information.

(c) The Commissioner shall review the petition, evaluate the evidence submitted, consider the results of any hearing conducted during the course of the proceeding, and issue or terminate an Order.

(d) If the Commissioner refuses to issue an Order the petitioner may, within 30 days and upon the submission of additional evidence, request reconsideration. If 30 days pass and no request for reconsideration is received, the refusal to issue an Order shall be considered final.

(e) The Commissioner may issue an Order that is valid for a period of up to three years. The Commissioner, in making a determination on the duration of the proposed Order, will be guided by the strength and weight of the evidence submitted.

G. DURATION OF ORDERS

(a) Orders shall endure for the period specified in accordance with Section F(e) above, but in no case longer than three years from the effective date of Chapter 9 of 17 U.S.C. in accordance with 17 U.S.C. 914(d)(1)(e) unless the authority of the Secretary is extended in accordance with 17 U.S.C. 914(f)(2).

(b) Orders shall be terminated if:

(1) The Commissioner finds after a proceeding under Section F above that the conditions upon which the Order was based no longer exist, or

(2) Mask works of nationals, domicilaries, and sovereign authorities of that foreign nation or mask works first commercially exploited in that nation become eligible for protection under: (i) a Presidential proclamation issued in accordance with 17 U.S.C. 902(a)(2), or (ii) that nation's own law for the protection of such works so long as that nation is a party to a treaty protecting such works to which the United States is also a party.

H. MAILING ADDRESS

(a) Petitions, requests for reconsideration, and all correspondence submitted pursuant to these guidelines shall be addressed to:

Commissioner of Patents and Trademarks
Box 4
Washington, D.C. 20231

(b) For further information contact:

Assistant Commissioner for External Affairs
703/557-3065
Mail inquiries should be directed to the same address indicated above to his attention.

SUMMARY

The initial guidelines set forth above are considered to be appropriate to implement Title 17 U.S.C. 914. They will become effective on the date of signature of H.R. 6163 by the President. They will provide appropriate guidance to mask work owners and their agents pending the issuance of regulations.

Nov. 1, 1984
Date

Rene D. Tegtmeyer
Acting Commissioner of Patents and Trademarks

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 1, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-25-82
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-09-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	6-19-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	6-18-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-23-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	12-14-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-13-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	5-09-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-06-81
DESIGN, GROUP 290—K. L. CAGE, Director	2-22-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	3-12-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-18-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	11-30-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-04-82

Expiration of patents: The patents within the range of numbers indicated below expire during September 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,339,206 to 3,344,432, inclusive

Plant Patents ..... Numbers 2,764 to 2,769 inclusive

REISSUES

NOVEMBER 13, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,729

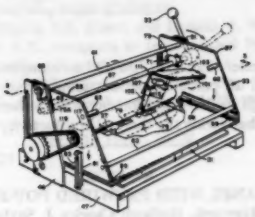
POWER ACTUATED LAMINATING MACHINE

Joe D. Giulie, and Leslie E. Worcester, both of Palo Alto, Calif., assignors to General Binding Corporation, Northbrook, Ill.

Original No. 4,097,326, dated Jun. 27, 1978, Ser. No. 784,680, Apr. 5, 1977. Application for reissue Nov. 30, 1978, Ser. No. 965,097

Int. Cl.[3] B30B *15/34*

U.S. Cl. 156—366 7 Claims



7. A laminating machine for use with pre-fabricated laminating packets wherein said packets have a pair of heat sealable sheets connected together at one edge with a tear-off tab at the point of connection, said tear-off tab having a generally straight end, comprising in combination:

a. upper and lower flat heating elements;

b. upper and lower rollers adjacent the exit end of said heating elements and spaced therefrom;

c. stop means engaging the tab such that portions of said tear off tab on said packet extend between said rollers and the heat sealable portion of the laminating packet is positioned between the heating elements;

d. means for engaging the tab between said rollers;

e. means for maintaining said packet between said heating elements for time sufficient to soften the laminating sheets; and

f. motor means for rotating said rollers after the laminating sheets are softened to pull said packet between said rollers to complete the laminating operation.

Re. 31,730

PROCESS FOR THE PREPARATION OF THE CRYSTALLINE MONOHYDRATE OF 7-(D-α-AMINO-α-(P-HYDROXYPHENYL)ACETAMIDO)-3-METHYL-3-CEPHEM-4-CARBOXYLIC ACID

Daniel Bouzard, Francoville; Abraham Weber, and Jacques Stemer, both of Paris, all of France, assignors to Bristol-Myers Company, New York, N.Y.

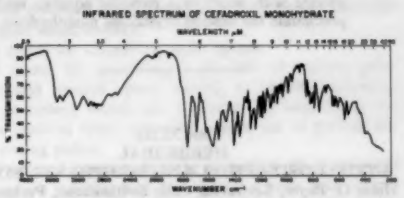
Original No. 4,160,863, dated Jul. 10, 1979, Ser. No. 874,457, Feb. 2, 1978. Division of Ser. No. 785,392, Apr. 7, 1977, abandoned. Application for reissue Nov. 30, 1982, Ser. No. 455,398

Claims priority, application United Kingdom, Apr. 27, 1976, 17028/76

Int. Cl.[3] C07D *501/22, 501/12*

U.S. Cl. 544—30 19 Claims

1. A process for the preparation of crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid monohydrate exhibiting essentially the following x-ray diffraction properties:



Line	Spacing d(A)	Relative Intensity
1	8.84	100
2	7.88	40
3	7.27	42
4	6.89	15
5	6.08	70
6	5.56	5
7	5.35	63
8	4.98	38
9	4.73	26
10	4.43	18
11	4.10	61
12	3.95	5
13	3.79	70
14	3.66	5
15	3.55	12
16	3.45	74
17	3.30	11
18	3.18	14
19	3.09	16
20	3.03	29
21	2.93	8
22	2.85	26
23	2.76	19
24	2.67	9
25	2.59	28
26	2.51	12
27	2.46	13
28	2.41	2
29	2.35	12
30	2.30	2
31	2.20	15
32	2.17	11
33	2.12	7
34	2.05	4
35	1.99	4
36	1.95	14
37	1.90	10

which process comprises

(a) silylating 7-aminodesacetoxycephalosporanic acid in an inert substantially anhydrous aprotic solvent;

(b) acylating the so-produced silylated 7-aminodesacetoxycephalosporanic acid with D(−)-α-amino-α-(p-hydroxyphenyl)acetyl chloride hydrochloride in an inert substantially anhydrous aprotic solvent in the presence of an acid acceptor;

(c) cleaving any silyl groups of the acylation product by hydrolysis or alcoholysis; and

(d) forming the desired monohydrate product by a method selected from

(1) upwardly adjusting the pH of the solution from step (c) in the presence of excess dimethylformamide to form the dimethylformamide solvate of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid; dissolving said dimethylformamide solvate

in acidified water or a mixture of acidified water and acetonitrile, and upwardly adjusting the pH of said acidified solution to precipitate the desired crystalline monohydrate;

(2) upwardly adjusting the pH of the solution from step (c) in the presence of excess dimethylformamide to form the dimethylformamide solvate of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid and contacting said dimethylformamide solvate with water or a partially aqueous medium to precipitate the desired crystalline monohydrate.

Re. 31,731

HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

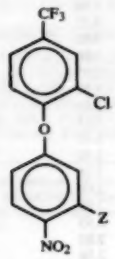
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa.

Original No. 3,928,416, dated Dec. 23, 1975, Ser. No. 331,719, Feb. 12, 1973. Continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,789,276. Application for reissue Sep. 1, 1978, Ser. No. 939,291

Int. Cl.³ C07C *79/46*

U.S. Cl. 562—435 **5 Claims**

7. A compound of the formula:



wherein Z is a carbalkoxy group having 1 to 4 carbon atoms in the alkoxy moiety.

Re. 31,732

PLASTIC HEAT EXCHANGE APPARATUS

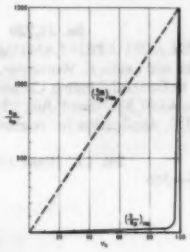
Thomas A. Reilly, Reading, Pa.; Charles F. Reitz, and Robert D. Smith, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,718,181, dated Feb. 27, 1973, Ser. No. 64,221, Aug. 17, 1970. Application for reissue Aug. 17, 1981, Ser. No. 293,330

Int. Cl.³ F28F *21/06*

U.S. Cl. 165—180 **8 Claims**

1. An improved heat exchanger of the type comprising: a casing member; a plurality of hollow, flexible fluid-tight plastic filaments; means for securing the end of said filaments in fixed relationship with said casing member, means for passing a first fluid through the interior of said filaments and means for passing a second fluid through said casing member into intimate contact with the outer surface of said filaments; the improvement wherein said filaments comprise a plastic composition containing 5 to 45 percent by weight of *graphite* filler particles having a thermal conductivity substantially greater than the thermal conductivity of the plastic, substantially all of said filler particles having a diameter greater than 2.0 microns and the ratio of the diameter of said filler particles to the wall thickness of said filaments being 0.001 to 0.5, said filler particles having a distribution in said plastic composition which is homogeneous enough so that said filaments have a tensile



strength greater than 1,000 psi and an elongation to failure of greater than 25 percent at room temperature and heterogeneous enough so that said filaments have a thermal conductivity greater than twice the thermal conductivity of said plastic.

Re. 31,733

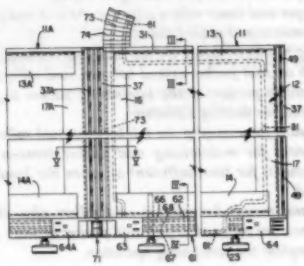
WALL PANEL WITH PREWIRED POWER SYSTEM

Richard G. Haworth, Holland; Charles J. Saylor, Park Township, Ottawa County, and Harold R. Wilson, Holland Township, Ottaway County, all of Mich., assignors to Haworth Mfg., Inc., Holland, Mich.

Original No. 4,060,294, dated Nov. 29, 1977, Ser. No. 615,506, Sep. 22, 1975. Application for reissue May 30, 1979, Ser. No. 43,908

Int. Cl.³ H01R *39/00*

U.S. Cl. 339—4 **29 Claims**



1. In a portable, prefabricated wall panel positionable in a vertical upright position and having a frame and panel means secured to the opposite sides of said frame and defining the exterior vertical side surfaces of said panel, the improvement comprising elongated channel means fixedly secured to said panel, said channel means extending across said panel between a pair of opposed edges thereof and defining a closed interior passage extending longitudinally therealong, first and second electrical terminals fixedly mounted on said panel adjacent the opposite ends of said channel means and disposed adjacent the opposed edges of said panel, at least said first electrical terminal including a pair of first multiple-hole electrical sockets formed therein, one of the pair of first sockets being on one side of the panel and the other being on the other side of the panel, said first sockets each being adapted to receive a conventional two or three-pronged electrical plug therein, said first and second terminals each including a pair of second electrical sockets formed therein, one of the pair of second sockets being on one side of the panel and the other being on the other side of the panel, said second sockets each defining a plug receptacle having a different geometrical configuration from the plug

receptacle defined by each of said first sockets so that the plugs which mate with said second sockets will not mate with said first sockets, and electrical cable means extending along said passage and interconnected to said first and second terminals for transmitting electrical energy therebetween.

Re. 31,734

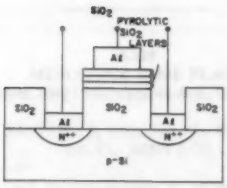
MODERATE FIELD HOLE AND ELECTRON INJECTION FROM ONE INTERFACE OF MIM OR MIS STRUCTURES

Donnelli J. DiMaria, Mt. Kisco, and Donald R. Young, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,104,675, dated Aug. 1, 1978, Ser. No. 808,501, Jun. 21, 1977. Application for reissue Jul. 25, 1980, Ser. No. 172,058

Int. Cl.[3] **H01L** *29/78*

U.S. Cl. 357—23 **14 Claims**



1. A metal-insulator-metal or metal-insulator-semiconductor structure [wherein the band gap of the insulator layer near one interface only is reduced] *comprising an insulator having a region of reduced band gap disposed near one insulator-metal interface only* to provide an injection region where holes or electrons, depending on voltage bias, can be injected into [the] *said* insulator under moderate electric field conditions from the contact at [this] *said one insulator-metal* interface while, simultaneously, electron or hole injection from the opposite interface is blocked due to the large insulator band gap near [this] *said opposite* interface.

Re. 31,735

SUBSCRIBER-LIMITED RECEPTION TELEVISION BROADCAST SECURITY ENCODER-DECODER SYSTEM

Richard A. Davidson, Deerfield, Ill., assignor to Feature Film Services, Skokie, Ill.

Original No. 4,215,366, dated Jul. 29, 1980, Ser. No. 33,020, Apr. 24, 1979. Continuation of Ser. No. 843,740, Oct. 19, 1977, abandoned. Application for reissue Jul. 26, 1982, Ser. No. 401,693

Int. Cl.[3] **H04N** *7/16;* **H04K** *1/04*

U.S. Cl. 358—124 **76 Claims**

1. A subscription television system for scrambling and unscrambling of standard television signals having horizontal scan lines that include horizontal synchronizing signals, vertical synchronizing signals, and video signals, and accompanying audio signals to enable reception of the video and audio signals in an intelligible manner only by authorized subscribers, said system comprising:

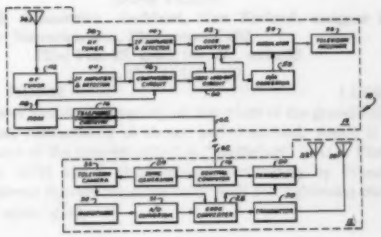
(1) transmitting means comprising:

(a) means for scrambling video signals by inversion of the video portion of some horizontal scan lines in a line-by-line fashion on a pseudo-random basis to produce a picture having some video signals inverted and others not inverted which produces a substantially unintelligible visual display;

(b) means for scrambling audio signals;

(c) means for generating a plurality of discrete pulse coded control signals serving to identify individual subscribers which are authorized to unscramble the scrambled video and audio signals and to provide decoding pulses;

(d) means for transmitting the scrambled video and audio signals together with the control signals, said control signals being transmitted separately and simultaneously during transmission of each of the horizontal scan lines on a separate preselected frequency distinct from the



video signals to determine whether or not the video portions of the next successive horizontal scan lines is are to be inverted; and

(2) receiving means comprising:

(a) means for receiving the transmitted scrambled video and audio signals together with the control signals;

(b) means for storing a unique subscriber identity code;

(c) means for comparing each of the discrete pulse coded control signals with the stored identity code

(d) unscrambling means converting said control signals into decoding pulse and responsive to said comparing means when there is a code match for unscrambling of the video and audio signals by means of said decoding pulse in the same sequence as used for scrambling to provide restored video and audio signals without degradation in picture and sound qualities; and

(3) controlling means responsive to said plurality of control signals for continuously enabling each of the individual unscrambling means at a particular subscriber's receiving means on a selective basis so that if the comparing means fails to produce a code match for an individual subscriber identity code before a pre-selected time interval has elapsed the unscrambling means is automatically disabled.

Re. 31,736

REACTIVE COMPUTER SYSTEM ADAPTIVE TO A PLURALITY OF PROGRAM INPUTS

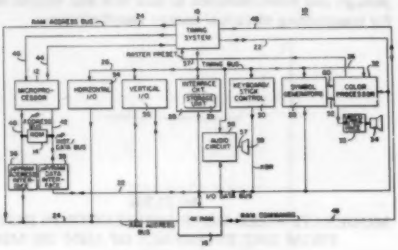
David J. Mueller, Naperville; Daniel G. Prysby, Elk Grove; John V. Moravec, Willow Springs, all of Ill., and George A. Watson, Fullerton, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Original No. 4,213,189, dated Jul. 15, 1980, Ser. No. 806,304, Jun. 13, 1977. Application for reissue Jul. 15, 1982, Ser. No. 398,719

Int. Cl.[3] **G06F** *3/00*; **G06K** *15/20*

U.S. Cl. 364—900 **59 Claims**

54. A data processing and display system for displaying on a color display means an image of an arrangement of characters selected from a set of characters and colored from a palette of colors where the image is stored as image data in addressable memory locations, the system including a display control means for first addressing the image data in a first portion of the addressable memory locations to obtain a first readout indicative of a character to be displayed, and secondly, for using the first readout data for addressing a second portion of said addressable memory locations to obtain signals indicative of the character color, said display control means being coupled to said color display means to



apply the character signals to be displayed by said color display means.

PLANT PATENTS

GRANTED NOVEMBER 13, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,328
ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Mar. 14, 1983, Ser. No. 458,144
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers variegated to striped, in differing degrees and patterns, with red and white, the bud being pointed in the early opening stage, resembling in form Easter Morning (miniature — U.S. Plant Pat. No. 2,177, expired), with the open flower being very full (double) and rounded with many (80 or more) petals; and further characterized by a plant of compact, vigorous, well rounded shape, with main stems and shoots quite thorny, the said plant being easy to propagate from soft wood cuttings with an abundance of small semi-glossy to matt foliage, the flowers being borne singly or several together in clusters on medium to short length stems.

5,329
MINIATURE ROSE PLANT

Leslie E. Strawn, 10422 Morningside Ave., Garden Grove, Calif. 92643

Filed Mar. 9, 1983, Ser. No. 473,582
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are in a color hue similar to Rise and Shine (miniature — U.S. Plant Pat. No. 4,231) giving a coloring effect ot tints and tones of a deep clear yellow and resembling Over the Rainbow (miniature — U.S. Plant Pat. No. 3,472) in form and size, having buds and flowers of a distinct and unusual appearance as compared to other miniature rose plants; said flowers being fully double, uniquely formed with high centers; and further charactized by its vigor, abundant foliage and ease of propagation from soft wood cuttings and by budding, and with an abundance of flowers.

5,330
MINIATURE ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Mar. 14, 1983, Ser. No. 461,986
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of exhibition form, essentially light pink in color, the petals being a blend of pink shades and changing to darker pink at petal tips in more mature stage, and further characterized by a plant of compact well rounded shape, vigorous, with the main stems and shoots being moderately thorny, the said plant being easy to propagate from cuttings or by budding, with an abundance of small semi-glossy to matt foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

5,331
MINIATURE ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Mar. 14, 1983, Ser. No. 458,145
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of exhibition form, essentially dark red in color, the petals on outside surface being darker (blackish) red than the red on inside surface, and further characterized by a plant of compact well rounded shape; vigorous, with the main stems and shoots being of average thorniness, the said plant being easy to propagate from cuttings or by budding, with an abundance of small semi-glossy to matt foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

5,332
ROSE PLANT

Frank B. Schuurman, Auckland, New Zealand, assignor to DeVor Nurseries, Inc., Pleasanton, Calif.

Filed Feb. 25, 1983, Ser. No. 469,650
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of rose plant of the grandiflora rose class, substantially as shown and described, which is a color sport of the rose identified as "Meihelvet" in U.S. Plant Pat. No. 3,095 and is characterized particularly by French Rose colored flowers retaining color well and lightening only slightly upon aging.

5,333
APPLE TREE

James N. Cummins; Herb S. Aldwinckle, both of Geneva, N.Y., and Ross E. Byers, Winchester, Va., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,897
Int. Cl.[3] A01H 5/03
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct cultivar of apple tree, substantially as shown and described herein, characterized particularly as to novelty by being resistant to pine voles, meadow voles, and crown rot and being easily propagated by cuttage.

5,334
APPLE TREE 'TOP-SPUR'

Harry M. Kemp, Olympia, Wash., assignor to C & O Nursery, Wenatchee, Wash.

Filed Jul. 26, 1982, Ser. No. 401,819
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—35 1 Claim

1. The new and distinct variety of Red Delicious apple tree substantially as shown and described, characterized in particular in the shape and coloration of its fruit both as to skin and flesh, referring to Red Chief as the principal basis of comparison in view of its similarity to Red Chief in most other respects and also, secondarily to Starkrimson, Ace and Wellspur.

5,335

ELM TREE CALLED REGAL

Eugene B. Smalley, Madison, Wis., and Donald T. Lester, Lake Oswego, Oreg., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 7, 1983, Ser. No. 473,176
Int. Cl.[3] A01H *5/12*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of elm tree called Regal as herein described and illustrated primarily characterized by its high resistance to Dutch elm disease and its columnar growth habit.

5,336

HEATHER NAMED ERICA SUNSET

Bruno L. Imazio, Watsonville, Calif., assignor to Bruno Imazio Nursery, Watsonville, Calif.

Filed Mar. 25, 1983, Ser. No. 478,879
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—54 1 Claim

1. A new variety of *Heather persoluta,* substantially as herein shown and described, particularly characterized by its profuse production of blooms over the entire length of the stem beginning early in December.

5,337

DISTINCT VARIETY OF STREPTOCARPUS NAMED REVOLTE

Herbert Kaiser, Rieskirchen, Fed. Rep. of Germany, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed May 13, 1983, Ser. No. 494,550
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of Streptocarpus substantially as herein shown and described.

5,338

CHRYSANTHEMUM PLANT NAMED GRENADINE

Jack M. Meek, deceased, late of Salinas, Calif.; Saundra J. Meek, executrix by, Canyon, Tex.; William E. Duffett, Salinas, Calif., and Grace H. Mack, New Canaan, Conn., assignors to Grace H. Mack, New Canaan, Conn.

Filed Sep. 23, 1982, Ser. No. 422,149
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—76 1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Grenadine, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, decorative capitulum type, coral bronze ray floret color, diameter across face of capitulum up to 75 mm., short plant height, spreading branching pattern, average natural season flowering date of September 10, and average flowering response period of seven (7) weeks in photoperiodic controlled short day programs.

5,339

DWARF AUSTRALIAN TREE FERN

David A. Powell, and Salvador T. Jurado, both of Santa Ana, Calif., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Sep. 29, 1982, Ser. No. 428,509
Int. Cl.[3] A01H *9/00*
U.S. Cl. PLT.—88 1 Claim

1. A new and distinct plant variety of *Sphaeropteris cooperi* as shown and described, which is principally characterized by its compact and symmetrical growth, its greater foliage density, a higher number of fronds in the crown, and by a mature height and diameter substantially smaller than the standard variety.

PATENTS

GRANTED NOV. 13, 1984

ERRATA

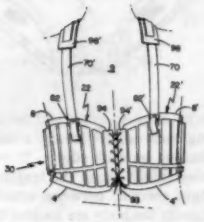
For CLASS	See PATENT NO.
446–015	4,481,731
180–233	4,481,877
604–004	4,481,946
277–012	4,482,086
384–480	4,482,194
534–556	4,482,489
534–797	4,482,490
523–400	4,482,667
556–446	4,482,729
585–670	4,482,752
378–144	4,482,837

PATENTS

GRANTED NOVEMBER 13, 1984

GENERAL AND MECHANICAL

4,481,679
RIB PROTECTOR
John B. Hayes, Walhalla, S.C., assignor to The Kendall Company, Walpole, Mass.
Filed Oct. 15, 1982, Ser. No. 434,543
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **16 Claims**



1. A contact sport rib protector adapted to cover at least the lower rib cage of a wearer, said protector comprising:

at least one flexible composite, laminated member having a tough, relatively resilient, outer protective membrane extending throughout the member and overlying and secured to a soft, resilient, rib-area-contacting inner membrane,

said outer membrane having a plurality of narrow, vertically extending, foam-filled, rib-area-protective protrusions spaced from one another by narrow, transversely spaced, longitudinally extending hinge areas extending between the top and bottom edges of said member and by at least one narrow, transversely extending hinge area located between the top and bottom edges of said member and extending between the opposite side edges of said member generally perpendicular to said longitudinally extending hinge areas,

said hinge areas comprising portions of said outer membrane essentially in contact with said inner membrane, whereby said hinge areas define said plurality of rib protective protrusions therebetween and permit bending of said protector thereat.

4,481,680
PROTECTIVE VISOR
Rosetta Mason, 2921 S. Western Ave., Los Angeles, Calif. 90018, and Ruthie J. Crowe, 621 W. 62nd St., Los Angeles, Calif. 90044
Filed May 20, 1983, Ser. No. 496,610
Int. Cl.³ A42B *00/00*
U.S. Cl. 2—174 **1 Claim**

1. A multi-purpose protective visor adapted to be positioned around the head of the user, said visor comprising:

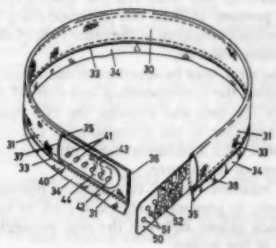
a strip of foldable material having first and second opposed arcuate sides, the second arcuate side defining an inner edge of the strip, the strip being substantially crescent shaped;

the inner edge of said strip having a raised rib;

the ends of said strip being joined together so that said raised rib is securely pressed against the head of the user, wherein the strip is folded so as to form a gutter between at least a portion of the first arcuate side and at least a

portion of the second arcuate side, the gutter extending across at least a portion of the head of the user.

4,481,681
ADJUSTABLE SWEATBAND FOR HEADGEAR
Benjamin Hankin, 323 Jefferson Ave., Buffalo, N.Y. 14204
Filed Apr. 9, 1982, Ser. No. 367,102
Int. Cl.³ A42B *1/02, 1/04*
U.S. Cl. 2—197 **4 Claims**



1. An adjustable sweatband, comprising: a substantially flat tubular casing fabricated of longitudinally expansible and contractible resilient material, affixed along one edge thereof to a semi-rigid headgear frame with its ends in ovelapping relationship, said casing having an interior surface adapted to engage a wearer's head said casing being substantially smooth and continuous and having an exterior surface normally facing said frame foldable downwardly therefrom:

a semi-rigid regulator strap of greater rigidity than said casing passing through and substantially enclosed by said casing and having one free end movable with respect to said casing and one stationary end fixed to said casing, the ends being in overlapping relationship;

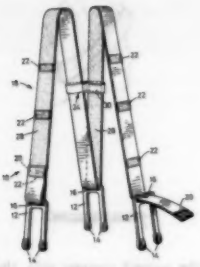
and cooperating engaging means on said free end and said stationary end of said strap for initially locking said free end to said stationary end in a position to place said casing under tension at an initial minimal circumference with said exterior surface of said casing being positioned adjacent said frame said strap being adjustable to any one of a plurality of circumferentially spaced positions by increasing the circumference of said strap whereby the casing will continue to lie adjacent said frame in a smooth, ungathered condition.

4,481,682

SUSPENDERS

Bradley G. Hall, 2395 Cawthra Rd., Unit 13, Mississauga, Canada

Filed Mar. 28, 1983, Ser. No. 479,819
Int. Cl.³ A41F *3/00, 19/00*
U.S. Cl. 2—326 **15 Claims**



1. Suspenders for pants or trousers comprising:
a connector for attachment to the rear of a garment,
a pair of connectors for attachment to the front of a garment,
an aperture in each garment connector,
a strap designed to pass through one front connector, aperture, over the shoulder of a wearer, through the rear connector aperture, over the other shoulder and through the other front connector aperture,
said strap having adjacent each end at least one first exposed portion of material of one type of the hook or loop of hook and loop fastener material,
said strap having, near each end and spaced from said one exposed portion, at least one corresponding second exposed portion of material of the other type of the hook and loop fastener material,
whereby the strap may be attached to each front connector by extending the corresponding end thereof through the connector aperture and pressing the two corresponding portions together, to the corresponding portions being so located that such attachment takes place on strap extents at the front of the wearer,
a junction member having two surface portions adapted respectively to contact, surfaces of each of the strap extents which extend between the rear connector and the shoulder of the wearer,
one of the mutually contacting surfaces of the junction member and of the rear strap extent being of hook type fastener material and the other of the mutually contacting surfaces being of a type to make pressure attachment to the last mentioned hook type fastener material.

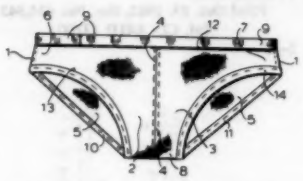
4,481,683

REVERSIBLE UNI-SEX GARMENT

José Estruch, San Juan, P.R., assignor to Fabrilmalla, Inc., Guaynabo, P.R.

Filed Jun. 3, 1982, Ser. No. 384,478
Int. Cl.³ A41F *19/00*
U.S. Cl. 2—400 **2 Claims**

1. Reversible pants wearable by men or women which comprises;
a cloth body having a first planar surface and a second opposite planar surface, said cloth body being adapted by size and configuration to fit a male or female human being as pants;
said cloth body having a first peripheral edge corresponding to the waist of the wearer;
said cloth body having a second peripheral edge defining an aperture of the pants for receiving a leg of the wearer;
said cloth body having a third peripheral edge, defining an aperture of the pants for receiving a second leg of the wearer;
the first, second, and third peripheral edges being finished with an elastic tape binding;
said binding comprising two elastic bands, each band having at least one lengthwise edge, said tape being positioned to



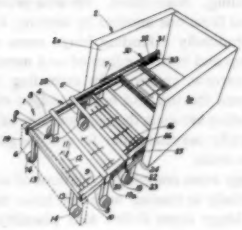
partially overlie edge to edge and secured together by stitching along each edge whereby a zone is formed between the stitching on each edge;
said binding being folded along the length of said zone, to form two edges thereof, between which the respective peripheral edges of the body are located to form an elastic, totally flat binding of very little thickness.

4,481,684

SINGLE SLEEPER FURNITURE HAVING FLEXIBLE SUPPORT FRAME

Warren Hauck, 8020 Brooks Rd., Harrison, Ohio 45030

Filed Apr. 9, 1982, Ser. No. 366,843
Int. Cl.³ A47C *17/06*
U.S. Cl. 5—18 R **14 Claims**



1. In furniture structure of the type having a pair of spaced vertically extending side members, the improvement in combination therewith comprising:
a plurality of linearly extensible generally rectangular frame member means slidingly joined to each other so that in a closed position the frame members may lie in overlying relationship within the furniture structure and in an opened position the frame members are substantially coplanar to form a generally horizontal reclining surface outside of the furniture structure, each of said frame member means comprising a generally rectangular frame and a plurality of substantially non-stretchable wires attached to their ends to spaced locations on the frame to form a supporting mesh;
leg means for supporting each of said frame members from the floor; and
means for slidably attaching said frame between the side members of the furniture structure such that when said frame is pulled out to the opened position, the rearmost one of said frame members will be positioned such that the reclining surface does not extend between the side members, said rearmost frame member being slidably attached to the inside surfaces of said side members, said attaching means including an elongated horizontally extending slot

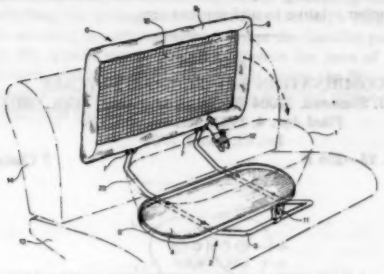
provided on the inside surface of each of said side members and a pin extending outwardly from each side of the rearmost frame member slidingly cooperating with said slot.

4,481,685

BASSINET RESTRAINT FOR INFANTS

Ian J. Watson, 7 Tingara St., Whitebridge, Australia

Filed Jul. 23, 1982, Ser. No. 401,171
Int. Cl.³ A47D 7/04
U.S. Cl. 5—94 7 Claims



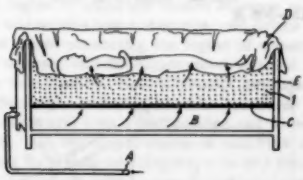
1. A bassinet restraint for motor vehicles comprising a base portion arranged to support the bottom of said bassinet, a cover portion engageable with said base portion and arranged to cover, locate and engage said bassinet between said cover portion and said base portion, and attachment means arranged to engage with one or more seat-belts in said motor vehicle so as to restrain said bassinet in place on a seat vehicle in use wherein said attachment means includes an attachment means engageable with a seat-belt end protruding from the junction between the cushion and squab of the seat, and said base portion includes a rearwardly upwardly inclined portion adapted for said seat-belt to pass thereover when engaged with said attachment means so that upon a front or impact of said vehicle said inclined portion can slide forwardly under said belt as the forward edge of said bassinet tilts outwardly and upwardly.

4,481,686

AIR FLUIDIZED BED FOR THERAPEUTIC USE

Francois R. Lacoste, 35 Boulevard d'Inkermann, 92200 Neuilly, France

Filed Mar. 21, 1983, Ser. No. 477,497
Claims priority, application France, Mar. 25, 1982, 82 05064
Int. Cl.³ A61G 7/04
U.S. Cl. 5—453 4 Claims



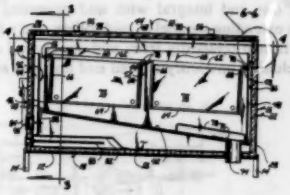
1. An air-fluidized bed for therapeutic use comprising a tank filled with a particulate material through which air flows upwardly, the material being covered by a porous sheet, characterized by the introduction, in said particulate material, of spherical particles having a size of the same order of magnitude as said particulate material and greater biochemical activity than said particulate material, said particles having a density higher than that of said particulate material.

4,481,687

DEVICE FOR CLEANING BEE HIVE FRAMES

Maurice W. Arndt, 116 11th St., SE., Altoona, Iowa 50009

Filed Sep. 15, 1983, Ser. No. 532,314
Int. Cl.³ A01K 51/00
U.S. Cl. 6—12 R 10 Claims



9. A device for cleaning rectangularly shaped bee hive wax frames comprising:

an insulated box having sidewalls, a top wall, and a bottom wall defining a heating compartment, said bottom wall having a drain opening therein providing communication from the interior to the exterior of said heating compartment,

a ramp wall mounted within said compartment and dividing said compartment into upper and lower portions, said ramp wall being inclined from an upper end towards a lower end; said lower end being said drain opening;

drain means extending through said lower end of said ramp wall and through said drain opening;

hanger means above said ramp wall for suspending a plurality of said bee hive frames within said upper portion of said compartment;

a heating element within said compartment for heating the air within said compartment to a temperature at least sufficient to melt said wax on said frames whereby said wax will melt, run down said ramp wall and through said drain means;

said compartment being filled with air and being substantially free from water;

a thermostat mounted within said compartment and connected to said heating element for controlling the maximum air temperature within said compartment to a range of from 200° F. to 300° F.

4,481,688

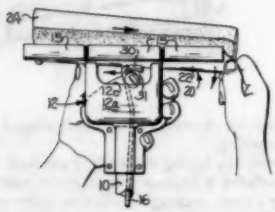
CLEANING SPONGE CONNECTION FOR A WRINGER-TYPE MOP

John W. Graham, Simpsonville, S.C., assignor to Chambertin Corporation, Simpsonville, S.C.

Filed Oct. 19, 1983, Ser. No. 543,438
Int. Cl.³ A47L 13/144
U.S. Cl. 15—119 A 4 Claims

1. In a wringer-type mop including an elongate handle, a cleaning head support housing fixed on one end of said handle and having generally flat front and rear side walls and bifurcated end walls forming support legs, first and second sets of spaced-apart rollers supported on said support legs of said housing and defining an elongate passageway therebetween, an operating rod extending along said handle and having an upper end terminating along a medial portion of said handle, an operating lever operatively connected to the upper end of said operating rod and said handle and being operable to impart longitudinal inward and outward movement to said operating rod, a channel including an upper wall and side walls extending between said spaced-apart sets of rollers, and a cleaning sponge having an upper portion fixed between said side walls of said

channel and having a lower portion normally extending outwardly in a cleaning position between said spaced-apart rollers, said operating lever being manually movable to selectively move said cleaning sponge inwardly to squeeze the same between said rollers and to move said cleaning sponge outwardly to cleaning position, the combination therewith of improved connecting means for selectively connecting and disconnecting the lower end of said operating rod with said channel for removal and replacement of said cleaning sponge, said improved connecting means comprising a latch hook having one end integral with said operating rod, a medial portion extending parallel to said rollers, and a free end, a latch tunnel turned upwardly from said upper wall of said channel and including upwardly curved end portions at opposite ends



thereof, and depressions formed in said channel and at opposite ends of said latch tunnel, said medial portion of said latch hook extending beneath said latch tunnel with its longitudinal axis parallel with and at the same level as the upper surface of said upper wall of said channel so that longitudinal movement of said medial portion of said latch hook is normally limited by said depressions, said side walls being provided with elongate access slots to permit entry of the finger, said cleaning sponge being removable from said latch hook to replace the same by moving the end of said channel corresponding with the free end of said latch hook inwardly between said rollers so that said channel assumes an acute angular position relative to said latch hook so that said latch hook may be longitudinally moved and easily removed therefrom by a finger inserted through the access slot in one of said side walls.

4,481,689

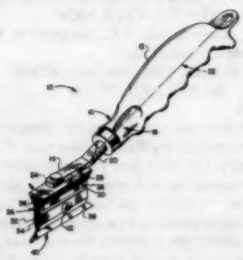
SCRAPING TOOL

Burton Westmoreland, 319 Huffhines, Richardson, Tex. 75081

Filed Jul. 19, 1982, Ser. No. 399,298

Int. Cl.³ A47L *13/08*

U.S. Cl. 15—236 R **5 Claims**



1. A scraping tool comprising:

an elongate handle having an axially mounted connecting rod extending from one end;

a support arm coupled to said connecting rod at an angle, which forms an angled extension of said handle;

a pivotable holding member for holding a blade having a scraping edge;

a scraping blade mounted in the holding member having a scraping edge which is pivotable with said holding member to a position in which the scraping edge is aligned parallel to said support arm;

dowel means forming a pivotal connection between said support arm and said holding member about a pivot axis so that said scraping edge may be aligned with said support arm and may be swiveled about said pivotal connection to be angled with respect to said support arm; and

means for limiting the pivotal movement of said holding member relative to said support arm.

4,481,690

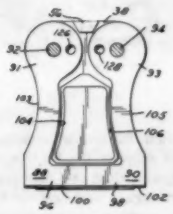
COMBINATION SCRAPER AND KEYCASE

Steven J. Simmons, 31004 W. Amurcon, Fraser, Mich. 48026

Filed Apr. 4, 1983, Ser. No. 481,726

Int. Cl.³ B60S *1/04*

U.S. Cl. 15—236 R **7 Claims**



1. A window scraper comprising, in combination:

a body member adapted to be held in the hand;

a pair of blade members each pivotally mounted on the body member for swingable movement between a position housed in the body member and a position extending outwardly therefrom;

said scraper blade members extending transversely of the projected dimension of the window scraper when said blades are extended operably outwardly from the body member in edge abutting relation and having scraper blade portions disposed in end-to-end relation forming a window scraper blade.

4,481,691

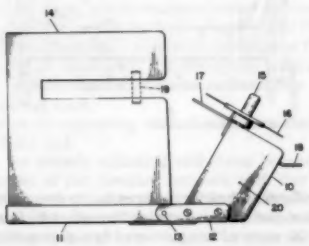
FILM CLEANER ATTACHMENT DEVICE FOR USE WITH DISC-FILM

Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356

Filed Feb. 14, 1983, Ser. No. 451,483

Int. Cl.³ B08B *5/02, 6/00*

U.S. Cl. 15—306 R **9 Claims**



1. The combination of: A film cleaner, for cleaning strip-film, having jaws containing air jet means, electrostatic sur-

face-charge neutralizing means and other means for removing dust from the surface of film, and: A disc film mounting arrangement for holding and passing disc-film through the jaws of the film cleaner is a manner such that the disc-film will be acted upon and cleaned by the film cleaner, said mounting arrangement having a spindle means upon which disc-film can be positioned, a holding means which clamps the disc-film to the spindle means, a plate means for mounting said spindle means, a rotating means for providing axial rotation of said spindle means, a release means for releasing the disc film from the spindle means, a case means for containing and supporting the components of the arrangement, a coupling means for attaching the arrangement to the film cleaner, a hinge means for pivoting the arrangement such that the disc-film positioned on the spindle means will pass between the jaws of the film cleaner, and an actuation means that causes the film cleaning means to operate when the disc-film is moved within the jaws of the film cleaner.

4,481,692

OPERATING-CONDITION INDICATOR FOR VACUUM CLEANERS

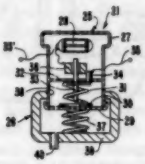
Gerhard Kurz, Industriestrasse, 7261 Althengstett, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,286

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311380

Int. Cl.³ A47L 9/19

U.S. Cl. 15—339 **4 Claims**



1. A device for indicating the condition of a vacuum cleaner of the type having a diaphragm switch which responds to a vacuum, an indicating member, a dust bag, a motor-driven turboblower positioned in front of said dust bag, connecting means for connecting the cleaner with a source of energy, a suction hose connection with an opening formed therein, said turboblower operating on said suction hose connection, and a constricted region of transition located between said turboblower and said suction hose connection; said device comprising: conduit means connecting the region of transition with said switch whereby said diaphragm moves in a first direction in response to a vacuum, electric contact means associated with said diaphragm and adapted to be connected together when said diaphragm is in a first position and to be disconnected when said diaphragm moves in said first direction, biasing means for biasing said diaphragm to said first position in response to a vacuum below a preselected value corresponding to the filling of the dust bag to a preselected amount, and lead means connecting said electric contact means in circuit with said indicator means and said connecting means, whereby said indicator is illuminated in response to connection of said connecting means to a source of energy and in the absence of vacuum to indicate readiness of the vacuum cleaner for operation and in response to the filling of the dust bag to said preselected amount.

4,481,693

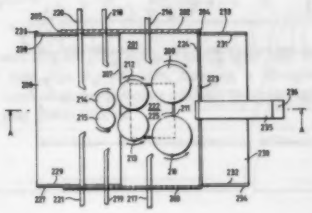
METHOD AND APPARATUS FOR TREATING FISH CARCASSES FOR SEPARATING FLESH FROM FRAMES AND SKINS

William P. Cowie, Aberdeen; Drummond M. P. Lawrence, and Morgan H. Goodlad, both of Aberdeenshire, all of Scotland, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Oct. 14, 1981, Ser. No. 311,286

Int. Cl.³ A22C 25/16

U.S. Cl. 17—46 **6 Claims**



5. A method for treating decapitated and gutted but otherwise whole fish carcasses which are unskinned and include the fish backbone or frame so as to separate flesh from the frame and skin, which comprises providing a first pair of contra-rotating, parallel, resiliently surfaced, profiled squeeze rollers having vertically disposed axes, positioning the rollers to provide a nip therebetween having an entrance side and an exit side, the nip being such that the tail and skin of the fish carcass are gripped sufficiently tightly to be drawn between the squeeze rollers without being significantly damaged while flesh is expressed from the carcass, providing a second pair of contra-rotating, parallel pre-squeeze rollers which are also vertically disposed to provide a vertical nip which has an entrance side and an exit side, said second pair of rollers being spaced to provide a slightly wider nip than the nip between the first pair of rollers, said second pair of rollers also being positioned sufficiently close to the first pair so that fish carcasses fed into the entrance side of the nip of the second pair of rollers pass out of the exit side of the nip of said second pair of rollers and are guided directly into the nip between the first pair of rollers, providing a third pair of contra-rotating, vertically disposed rollers having a nip which is adapted to draw the fish carcass directly from the exit side of the hip of the first pair of rollers and has a width such that the tail and backbone of the fish carcass can be tightly engaged without breaking, passing the decapitated and gutted but otherwise whole fish carcass tail first between the nip of said second pair of rollers and then directly through the nip of said first pair of rollers whereby the tail and skin of the carcass are drawn through the nip of said first pair of rollers while the flesh of the fish carcass is expressed from the head end of the carcass at the entrance side of the nip of said first pair of rollers, collecting the expressed flesh at a point below the entrance side of the nip of said first pair of rollers, passing the remaining fish frame and skin through the nip of said first pair of rollers and then directly through the nip of the third pair of rollers and separately collecting the fish frame and skin after they exit the nip of said third pair of rollers.

4,481,694
FLEECE LAYERING APPARATUS

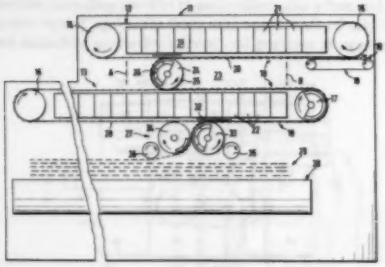
Johann P. Dilo, Eberbach, Fed. Rep. of Germany, assignor to Oskar Dilo Maschinenfabrik KG, Eberbach, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,689

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125946

Int. Cl.³ B65H *45/103*

U.S. Cl. 19—296 **8 Claims**



1. In a fleece layering apparatus for forming a fibrous fabric web consisting of several layers of fleece, and having delivery means depositing the input web of fleece, said web made up of textile fibers in a zig-zag manner, onto a movable support or onto a web of fleece already laid on the support, said delivery means being arranged on a carriage which can reciprocate between two end positions, and with delivery belts supporting the continuously input fleece, transporting it and storing it at intervals, the improvement therein being:

an upper, fixed, air-permeable, endless delivery belt looped around spaced apart rollers;

vacuum chambers, having controllable degrees of vacuum above the lower strand of said upper belt, vacuum from said vacuum chambers drawing said fleece web against the bottom side of said lower strand;

a lower, fixed, air-permeable, endless delivery belt running parallel to said upper belt and looped around spaced apart rollers;

vacuum chambers with controllable degrees of vacuum located above the lower strand of said lower delivery belt, the vacuum from said chambers drawing the adjacent portion of said fleece web against the bottom side of said lower strand;

a fleece transferring roll positioned between said two delivery belts, said fleece transferring roll being reciprocable between two end positions, said roll being adapted to attract and hold said web thereto;

a fleece doffing and cuttling device located beneath said lower delivery belt, said doffing and cuttling device being reciprocable between two end positions.

4,481,695
WIRE ROPE CONNECTOR WITH LENGTH ADJUSTMENT CAPACITY

Karl H. Koster, Essen, and Roland Günther, Wesel, both of Fed. Rep. of Germany, assignors to AUMOND-Fördererbau GmbH Maschinenfabrik, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,150

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142572

Int. Cl.³ F16G *3/00*

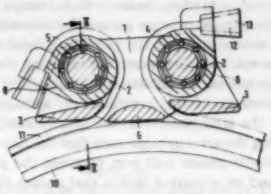
U.S. Cl. 24—32 **11 Claims**

1. A connection unit for connecting two rope ends together, comprising:

a plate;

at least one pin extending from said plate;

a takeup part mounted for rotation on said at least one pin, said takeup part having a stop for engaging and holding one of the two rope ends, the other of the two rope ends connected to said plate; and



friction means connected between said takeup part and said at least one pin for holding said takeup part at a selected rotational position on said at least one pin.

4,481,696
SNAP-FIT BUTTON

Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

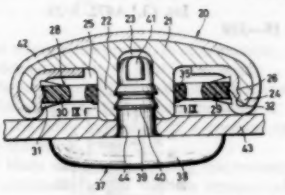
Filed Mar. 4, 1982, Ser. No. 354,670

Claims priority, application Japan, Mar. 13, 1981, 56-35955[U]

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.³ A44B *1/12, 1/38*

U.S. Cl. 24—113 R **9 Claims**



1. A button for attachment to a piece of cloth having a preformed aperture, comprising:

(a) a button body including a domed head and a central boss projecting from said domed head and having a hole therein, said central boss having a cylindrical outer surface and a cylindrical bore having a continuous circumferential wall and closed at its outer end, said domed head having a peripheral flange surrounding said central boss in shaped relation, said central boss having a plurality of axially extending slots spaced angularly at equal intervals;

(b) a retainer washer of synthetic resin adapted to be mounted on said boss resiliently with a force fit and having an outer periphery adapted to coact with said peripheral flange of the domed head in gripping an edge portion of a flexible covering member for extending over said domed head and around said peripheral flange;

(c) a fastener having a base and a central shank projecting from said base and adapted to fit forcibly into said hole in the central boss through the aperture in the piece of cloth to sandwich the piece of cloth between said base and said button body, said shank having on its outer periphery a plurality of axially extending ridges spaced angularly at intervals corresponding to said slots on the central boss, and disposed for respective locking engagement therewith;

(d) said peripheral flange of said domed head having an annular projection extending therearound and projecting toward said boss; and

(e) said retainer washer having a peripheral groove extend-

ing therearound and adapted to be snapped over said annular projection for receiving partly the edge portion of the covering member.

4,481,697

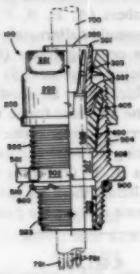
COMBINED STRAIN RELIEF AND CORD GRIP

Walter W. Bachle, Harwinton, Conn., assignor to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 382,879, May 28, 1982, abandoned. This application Nov. 30, 1983, Ser. No. 556,070

Int. Cl.³ H02G *3/22*; F16L *21/02*

U.S. Cl. 24—135 R **13 Claims**



1. In a cord grip having a body member with a passageway therethrough for the cord and with an upper chamber, a nut threadedly engageable with said body and having an internal shoulder and an upper end with an opening therein, a compressable grommet in said upper chamber, said grommet having an upper end and recesses in its internal surface extending longitudinally thereof from said upper end of said grommet, the improvement comprising a strain relief and gripping member extending through said opening in said upper end of said nut into said upper chamber, said strain relief and gripping member having a plurality of laterally opposed elongated members extending longitudinally thereof, said elongated members being disposed in different ones of said recesses in the internal surface of said grommet, flanges extending radially outward from said elongated members and disposed centrally of the length thereof, the lower surface of each of said flanges being seated upon said upper end of said grommet, the upper surface of each of said flanges being engageable with said shoulder of said nut to pivot the lower ends of said elongated members inwardly into gripping engagement with the cord and to compress said grommet into engagement with the cord.

4,481,698

CHUTED MIXER FORMING METHOD

Alan F. Salerno, 25 Holten St., Peabody, Mass. 01960

Filed Jun. 1, 1982, Ser. No. 384,130

Int. Cl.³ B21K *3/04*; B23P *15/02, 15/04*

U.S. Cl. 29—156.8 R **6 Claims**

1. A method of forming a band for forming a chuted mixer comprising the steps of:

providing a flat outer edge and a radially inner edge, said outer edge including a plurality of circumferentially spaced, radially inwardly disposed dips;

cutting said blank radially from said inner edge to said outer edge;

providing a die having a bulge progressively increasing in height from a front end to a back end thereof;

pressing said blank over said bulge of said die to form a convolution in said blank in a manner wherein said die bulge is aligned radially in relation to said blank at one of said dips, said front end of said bulge being disposed adjacent to said radially inner edge of said blank and said back end of said bulge being disposed adjacent to said one of said dips; and

repeating said step of pressing said blank over said bulge at each of said dips for thereby forming a straight band having convolutions defining chutes between adjacent ones of said convolutions.

4,481,699

METHOD FOR PRODUCING AN ELECTROMAGNETICALLY ACTUATABLE FUEL INJECTION VALVE

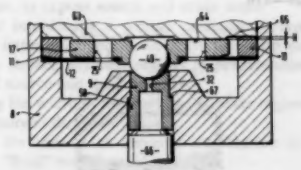
Heinrich Knapp, Leonberg; Rudolf Sauer, Benningen; Waldemar Hans, Bamberg; Mathias Linssen, Schesslitz; Jürgen Peczkowski, Bamberg, and Rudolf Krauss, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 167,623, Jul. 11, 1980, Pat. No. 4,365,747. This application Sep. 1, 1982, Ser. No. 413,649

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936425

Int. Cl.³ B21D *53/00*; B21K *29/00*; B23P *15/26*

U.S. Cl. 29—157.1 R **1 Claim**



1. A method for producing a fuel injection valve having an axially bored nozzle carrier, a nozzle positioned therein, a flat armature, a valve element positioned between said armature and said nozzle, and further provided with an annular inwardly extending shelf area comprising the steps of

assembling said flat armature provided with at least one diaphragm means and a stroke limiting ring into said nozzle carrier, said stroke limiting ring arranged to rest on said annular shelf area;

introducing a pressing tool into said nozzle carrier, said pressing tool including an armature engaging area and a stroke limiting ring engagement area;

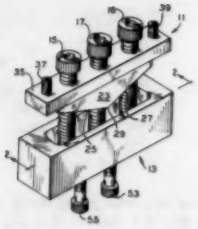
forcing said pressing tool into contact with said armature and said stroke limiting ring to force said stroke limiting ring into seated engagement with said shelf area; and

inserting a nozzle body into said axial bore and thereafter applying pressure toward said valve element to seat said nozzle body at a desired location in said bore.

4,481,700
PANEL PUNCH

Larry Redmon, 11625 Woodstone Pl., Fort Wayne, Ind. 46825

Filed Sep. 28, 1982, Ser. No. 424,892
Int. Cl.³ B23Q 17/00; B26F 1/00
U.S. Cl. 29—407 19 Claims

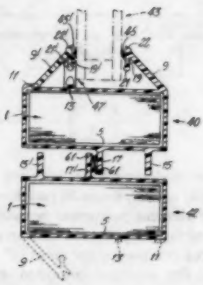


1. The method of cutting a hole having at most one line of symmetry in a panel comprising the steps of:
drilling a plurality of holes in the panel;
locating a punch on one side of the panel and a die on the other side of the panel;
threadedly coupling the punch and die together by a plurality of bolts passing through respective drilled panel holes;
tightening at least one of the bolts to draw the punch and die toward one another to cut the hole in the panel, and
tightening a pair of screws passing through one of the punch and die and having pointed leading ends to mark the panel for a subsequent further drilling operation.

4,481,701
CORED PLASTICS PROFILES AND MANUFACTURE OF FRAMES FOR WINDOWS AND THE LIKE THEREFROM

Michael J. Hewitt, 5 Hayling Crescent, Leicester, England (LE5 0RH)

Division of Ser. No. 253,502, Apr. 9, 1981, Pat. No. 4,420,920.
This application Sep. 15, 1983, Ser. No. 534,976
Claims priority, application United Kingdom, Aug. 29, 1979, 7929902; Jan. 11, 1980, 8000926; Jun. 24, 1980, 8018338
Int. Cl.³ B29C 17/08; B23P 17/00
U.S. Cl. 29—416 15 Claims

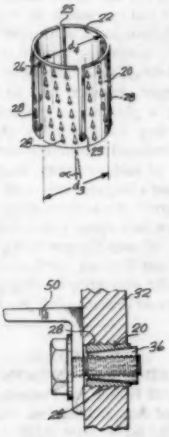


1. A method of manufacturing frames for windows from a cored extruded plastics profile for use in the manufacture of frames for panels including windows comprising a core of shape retaining material and a cladding of plastics material extruded therearound characterized in that the core (1) is of generally rectangular cross-sectional shape and in that the cladding (3) provides (a) along one surface of the profile at a locality adjacent one edge of said surface a retaining member (9) for a panel, which retaining member extends inwardly over said surface and is inclined at an angle thereto and (b) along said surface of the profile at a locality spaced from the retaining member, a rib (11) having an undercut face (23) inclined to said surface at an angle at least substantially corresponding to the angle of inclination of the retaining member (9), the retaining member being severable from the profile to form the profile into an outer frame (42) and being utilized as glazing strips (9') in the manufacture of a corresponding inner frame (40), the glazing strips (9') being arranged after insertion of a panel, to abut against the undercut face (23) of the rib (11) of the profile and to be supported by the supporting members (47) mounted on said surface of the profile, the method comprising the steps of feeding an indefinite length of the profile past sawing means organized to make a series of transverse cuts (31, 32, 33, 34, 35, 36, 37, 38, 39) at 45° across the profile so as to sever therefrom successively frame members (A, E, B, F, C, G, D, H,) of appropriate lengths for assembly alternately into an outer static frame (42) and an inner opening frame (40) for a window, severing the panel-retaining members (9) from those frame members (E, F, G, H) which are to be assembled into the outer frame (42), assembling the alternate frame members (A, B, C, D and E, F, G, H) to form said inner frame (40) and said outer frame (42), and after cutting the retaining members (9) severed from the frame members (E, F, G, H) for the outer frame to appropriate lengths, utilizing them as glazing strips (9') in assembling said inner frame (40) with a panel.

4,481,702
METHOD OF ASSEMBLING THREADED INSERT BUSHING WITHIN A WORKING MATERIAL

John D. Mitchell, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 429,893
Int. Cl.³ B23P 11/00
U.S. Cl. 29—432 6 Claims



1. A method for forming a threaded insert within a working material comprising the steps of:
(a) providing a frustoconically shaped cone nut having a first diameter d_1 at one end and a second diameter d_2 at the other end, where $d_1 < d_2$, the cone nut being provided with a threaded, longitudinal bore;
(b) providing a cylindrically shaped shell, the shell being provided with a longitudinal bore of diameter d_s, where $d_1 < d_s < d_2$, such that the shell is adapted to receive said first diameter d_1 of the cone nut, the shell being radially expandable upon penetration of the cone nut, and the outer surface of the shell being provided with a series of

barbs helically aligned with respect to the longitudinal axis of the shell;

(c) providing a keying means between the cone nut and the shell such that the cone nut is prevented from rotation relative to the shell when the cone nut is received therein;

(d) providing a predetermined diameter bore within the working material, said predetermined diameter being slightly smaller than the outer diameter of the shell;

(e) inserting a bolt through the shell bore and into the cone nut at the first diameter end, the threads on the bolt mating with the threads provided in the cone nut, thereby forming an assembly;

(f) inserting said assembly, second diameter end of the cone nut first, into the provided bore of the working material; and

(g) tightening said bolt such that said cone nut is pulled into the shell thereby radially expanding the shell and causing said barbs to embed in the working material.

4,481,703

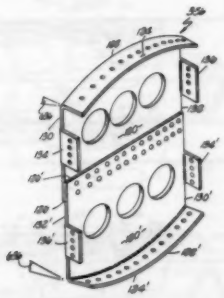
METHOD OF MAKING RIB STRUCTURES FOR AN AIRFOIL

Harry A. Scott, Hawthorne, Calif., assignor to Rockwell International Corporation, Los Angeles, Calif.

Division of Ser. No. 124,196, Feb. 25, 1980, Pat. No. 4,356,616. This application Mar. 17, 1982, Ser. No. 358,775

Int. Cl.³ B23P *17/00*; B64C *3/18*

U.S. Cl. 29—526 A **5 Claims**



1. A method of fabricating a plurality of rib structures for at least a segment of an airfoil which has a spanwise taper in thickness, varies in chord length, and has at least one aerodynamic surface having a substantially constant radius of curvature in the chordwise direction, said airfoil having said plurality of said rib structures at discrete spanwise locations, comprising the steps of:

forming a plurality of rib webs having upper and lower edges and first and second ends, said upper edges conforming to the radius of curvature of said segment; and

trimming at least one of said ends of each of said plurality of rib webs in amounts to form a plurality of pairs of rib webs of corresponding chords with at least some of said pairs having different chords from other of said pairs; and

coupling said corresponding rib web pairs together to produce said respective rib structures, said rib webs being coupled at their lower edges in inverted relationship to one another with respective rib structures having their lower edges progressively overlapped to form said plurality of rib structures to different heights.

4,481,704

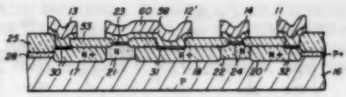
METHOD OF MAKING AN IMPROVED MESFET SEMICONDUCTOR DEVICE

Henry M. Darley, Plano; Theodore W. Houston, Richardson, both of Tex., and James B. Kruger, Half Moon Bay, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 70,380, Aug. 27, 1979, , which is a continuation-in-part of Ser. No. 898,582, Apr. 21, 1978, Pat. No. 4,201,997. This application Jan. 15, 1982, Ser. No. 339,543

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **9 Claims**



1. A method of making MESFET integrated circuit devices comprising the steps of:

forming a patterned silicon nitride layer on top of a silicon slice having a first conductivity type which is covered with a thin layer of silicon oxide to expose selected channel stopper areas;

implanting a conductivity-type determining impurity of a first type into a shallow surface adjacent region of the silicon in said channel stopper areas by exposing the slice to an ion beam, such implanting being done through said thin silicon oxide layer;

oxidizing the slice at an elevated temperature to create a thick silicon oxide coating in said exposed areas;

removing the remainder of said nitride layer;

implanting a second conductivity-type determining impurity opposite the first type into respective shallow surface adjacent regions of the surface of the silicon at both a first plurality and a second plurality of locations, by exposing the slice to an ion beam;

selectively implanting an additional dose of a second conductivity-type determining impurity opposite the first type into respective shallow surface adjacent regions of the silicon at said second plurality of locations only, by exposing the slice to an ion beam;

forming patterned dielectric stack regions including a patterned nitride region and an additional overlying dielectric layer, to expose source and drain areas;

selectively introducing a second conductivity-type determining impurity, opposite the first type into respective shallow surface adjacent regions in predetermined locations of source and drain areas;

narrowing the width of said patterned nitride regions within said patterned dielectric stack;

oxidizing the slice at an elevated temperature to form a thinner "field" oxide in selected areas;

patterning said thinner "field" oxide to expose contact and gate areas; and

applying a patterned conductive material which forms metal-semiconductor diodes at said gate areas, ohmic contacts at said contact areas, and interconnects between said gate and contact areas.

4,481,705

PROCESS FOR DOPING FIELD ISOLATION REGIONS IN CMOS INTEGRATED CIRCUITS

Jacob D. Haskell, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 14, 1983, Ser. No. 504,193

Int. Cl.³ H01L *21/76*

U.S. Cl. 29—571 **17 Claims**

1. In a process for fabricating complementary transistors in a semiconductor substrate having a first conductivity type well region in an opposite conductivity type substrate, the improve-

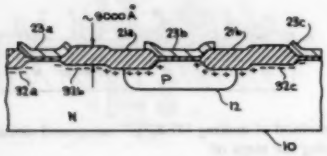
ment comprising introducing a field implant by a process comprising:

fabricating a first mask over a semiconductor substrate except for a first field region straddling the junction of the first conductivity type well-region and the substrate;

introducing first conductivity type impurity into the first field region;

forming insulating material over the first field region;

fabricating a second mask over the semiconductor substrate except for a second field region, said second mask at least



partially including a portion of said insulating material formed over said first field region, so as to dispose said first field region and said second field region such that said second field region is self-aligned with, and does not overlap, said first field region and such that an edge of said first field region is adjacent to, and in contact with, an edge of said second field region;

introducing opposite conductivity type impurity into the second field region; and

forming insulating material over the second field region.

4,481,706

PROCESS FOR MANUFACTURING INTEGRATED BI-POLAR TRANSISTORS OF VERY SMALL DIMENSIONS

Marcel Roche, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 25, 1982, Ser. No. 392,366

Claims priority, application France, Jun. 26, 1981, 81 12604

Int. Cl.³ H01L *21/265, 21/302, 21/283*

U.S. Cl. 29—577 C **11 Claims**

1. A process for manufacturing an integrated bipolar transistor of very small dimensions, wherein the steps of forming a base region and an emitter region of this transistor comprise:

(a) formation, on a monocrystalline silicon layer containing impurities of a first type of conductivity, of a polycrystalline silicon layer doped above the base region with an impurity of a second type of conductivity opposite to said first type,

(b) formation of an insulating layer on the polycrystalline silicon layer,

(c) selective etching of the insulating layer and of the polycrystalline silicon layer above a region in the monocrystalline silicon layer which will constitute an intrinsic base region, said etching forming vertical edges in said polycrystalline silicon layer, said selective etching being continued until the monocrystalline silicon layer in said intrinsic base region is laid bare,

(d) heat treatment for causing diffusion in the monocrystalline silicon layer of said impurity of the second type, so as to form in said monocrystalline silicon layer an extrinsic base region surrounding the intrinsic base region,

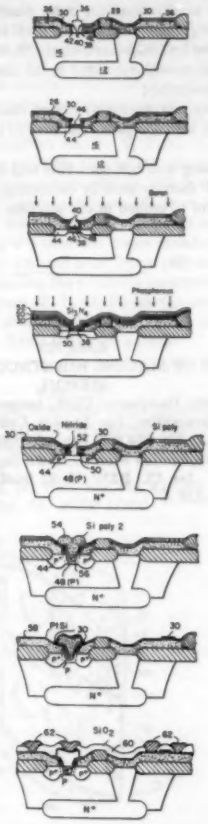
(e) doping of the monocrystalline silicon layer in the intrinsic base region with an impurity of the second type of conductivity,

(f) uniform deposition, by low pressure chemical vapor deposition, of a thin layer of silicon oxide,

(g) uniform deposition onto said thin layer of silicon oxide, by low pressure chemical vapor deposition, of a thin layer of silicon nitride,

(h) vertical ionic implantation, in the thin layer of silicon nitride, of an impurity capable of increasing the dissolution rate of said silicon nitride,

(i) dissolution of the silicon nitride layer for a time sufficiently long to lay bare the monocrystalline silicon layer in the intrinsic base region but not long enough to eliminate the silicon nitride on the vertical edges of the poly-



crystalline silicon layer, and not enough to lay bare the polycrystalline silicon layer where it is still covered by said insulating layer formed in step b), and

(j) doping, with an impurity of the first type of conductivity, of the monocrystalline silicon layer which has been laid bare, so as to form an emitter region.

4,481,707

METHOD FOR THE FABRICATION OF DIELECTRIC ISOLATED JUNCTION FIELD EFFECT TRANSISTOR AND PNP TRANSISTOR

Kevin F. Cunniff, Plainfield, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1983, Ser. No. 469,370

Int. Cl.³ H01L *21/20, 21/76*

U.S. Cl. 29—580 **4 Claims**

1. The method of fabricating a dielectrically isolated junction field effect transistor and a PNP transistor comprising the steps of:

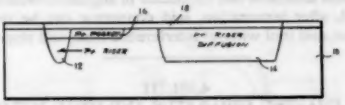
diffusing impurities of a first semiconductor type into the

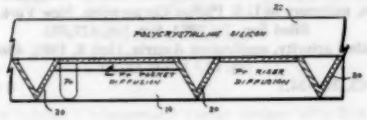
first surface of a semiconductor substrate to form a first and second region;

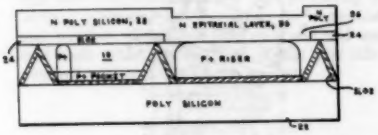
diffusing impurities of said first semiconductor type into said first surface of said semiconductor substrate and in contact with said first region to form a shallow pocket,

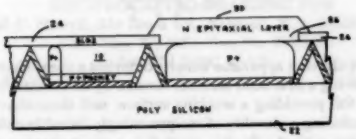
grooving said first surface of said semiconductor substrate and coating said grooves with an insulator to dielectrically isolate said first and second regions from each other;

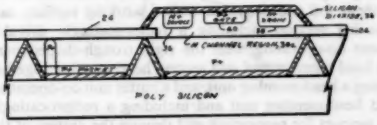
depositing a second semiconductor material on the insulator on said first surface of said semiconductor substrate;

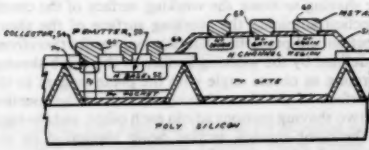












selectively forming an epitaxial layer of second semiconductor type on said second surface of said first semiconductor material in contact with said second region;

diffusing impurities of said second semiconductor type into said epitaxial layer to form a third and fourth region;

diffusing impurities of a said first semiconductor type into said epitaxial layer to form a fifth region between said third and fourth region and separated from both;

diffusing impurities of said second semiconductor type into another portion of the second surface of said first semiconductor type adjacent to but separated from said diffused impurities of said first semiconductor type to form the base of a transistor;

introducing impurities into said first region to form the collector of a transistor;

diffusing impurities of a third semiconductor type into said base of said transistor to form the emitter of said transistor;

said epitaxial layer, said third, fourth and fifth regions forming the channel, source, drain and gate respectively of a dielectrically isolated junction field effect transistor.

4,481,708

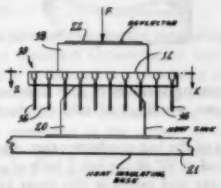
REDUCED INTERNAL TEMPERATURE TECHNIQUE FOR HERMETIC SEALING OF ENCLOSURES

Delip R. Bokil, Winchester, Mass., and Tanjore R. Narasimhan, Salem, N.H., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Jan. 18, 1982, Ser. No. 340,230

Int. Cl.³ H01L *21/48, 23/08;* B65D *7/28;* B23K *1/06*

U.S. Cl. 29—588 **5 Claims**



1. The method of packaging temperature-sensitive microelectronic devices, including hybrid integrated circuits, supported on a rigid hermetic planar substrate, comprising the steps of:

applying a meltable hermetic sealing material along a closed path defined by the interface between said substrate and a hermetic box-like cover surrounding the region for said microelectronic devices;

placing on said substrate said hermetic box-like cover having side walls aligned with and contacting said sealing material completely around said closed path;

directing infra-red radiation towards both said substrate and said cover from all sides thereof, said radiation striking the regions of both said cover and said substrate which are adjacent the interface therebetween;

shielding the top surfaces of said cover by means reflecting the radiation directed towards said top surfaces;

withdrawing heat from the lower surfaces of said substrate by heat sink means;

said radiation being applied simultaneously to all sides of the package structure for a time sufficient to melt said sealing material and to provide for fusion and/or bonding thereof with said substrate and said cover; and

removing said infra-red radiation to permit the melted sealing material to cool in a fused and/or bonded state with both said substrate and said cover to assure effective hermetic sealing of the completed package.

4,481,709

METHOD OF MAKING A COIL ASSEMBLY FOR HOT MELT INDUCTION HEATER APPARATUS

Arthur W. McDermott, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 260,970, May 6, 1981, Pat. No. 4,420,876. This application Aug. 24, 1981, Ser. No. 295,207

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.³ H05B *3/00*

U.S. Cl. 29—611 **7 Claims**

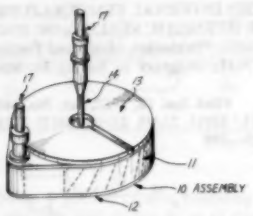
1. The method of making an induction heating coil comprising the steps of:

providing a conductor having a rectangular cross sectional area with an inner end and an outer end;

brazing an inner terminal lead and an outer terminal lead to the inner and outer ends of said onductor, respectively, with a high-temperature braze alloy;

wrapping said conductor by winding in spiral overlap fashion a polyimide tape around said conductor, said polyimide tape having a fluorocarbon resin coating on both sides;

winding under tension a plurality of turns of said conductor



so that opposing surfaces of said fluorocarbon resin coatings between windings of said conduct - are in direct contact;

after winding of the last conductor turn, forming of an outer terminal lead at 90° at the last ¼ inch of conductor turn to the coil body and opposite the inner terminal lead, and subsequently high temperature brazing inner and outer terminals to said terminal leads; and

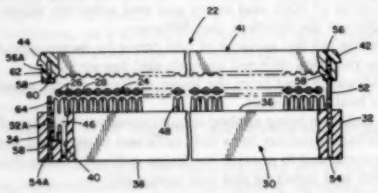
inserting of wedges to stabilize said outer terminal lead, and then winding a further plurality of turns on the coil outer diameter with dielectric polyimide tape.

4,481,710

TOOL FOR APPLYING CONNECTORS

Jack E. Caveney, Hinsdale; Roy A. Moody, Flossmoor, and John J. Bulanda, New Lenox, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Oct. 28, 1982, Ser. No. 437,413
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—749 **8 Claims**



1. A tool for applying an elongate connector to a plurality of insulated conductors, said connector comprising a base and a cover with said base having a plurality of spaced insulation displacement metallic terminal elements extending toward said cover and corresponding in number and position to said conductors, said cover and base being joined by interconnection means holding said connector in an insertion position wherein the spacing between said elements and said cover is greater than the thickness of said conductors, said cover and base being interconnected in the insertion position only adjacent respective first ends of said cover and base so that said conductors can be inserted past the respective second ends of said cover and base, said base and cover being relatively movable to a connector termination position wherein the spacing between said elements and cover is less with each terminal element engaging a corresponding conductor, said tool comprising:

a die for moving said connector to its termination position;

holding means for positioning said connector with respect to said die;

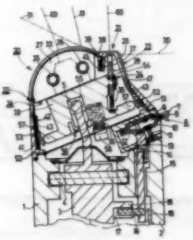
prime mover means connected to cause said die and a component of said holding means to undergo reiprocal movement relative to one another, said holding means comprising stop means positioned to engage siad connector when it is in the insertion position, said stop means being spaced from said connector when the connector is in its termination position whereby, prior to termination, said stop means maintains said connector in alignment with said die and, after termination, said connector can be removed from said tool without interference from said stop means.

4,481,711

DRY-SHAVING APPARATUS AND HEAD-MEMBER UNIT FOR SAID APPARATUS

Max Pachel, and Norbert Schneider, both of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,403
Claims priority, application Austria, Oct. 9, 1981, 4360/81
Int. Cl.³ B26B *19/10*
U.S. Cl. 30—34.1 **8 Claims**



1. A dry-shaving apparatus which comprises a shear-shaving section having a first head member formed by an arcuate flexible shear foil providing a working surface, said shear-shaving section including a plurality of reciprocatingly drivable cutters co-operating with the flexible shear foil; a comb-shaving section having a second head member constructed as a rigid trough-shaped part fixedly and permanently connected to the flexible shear foil and provided with a working surface, said comb-shaving section including a reciprocatingly drivable rigid cutter co-operating with the rigid trough-shaped part; said first head member and said second head member together constituting a head-member unit; and a cutter unit co-operating with said head-member unit and including a reciprocatingly drivable support for supporting and driving the cutters of the respective shaving sections; the working surface of the comb-shaving section adjoining the working surface of the shear-shaving section and projecting laterally outwardly therefrom, the plane defined by the working surface of the comb-shaving section forming an obtuse angle with the plane tangent to the working surface of the shear-shaving section at the location where the two shaving sections adjoin each other; and the rigid cutter of the comb-shaving section being supported by the cutter unit support by means of at least one spring.

4,481,712

KNIFE FOR RELEASIBLE ATTACHMENT TO A BASE

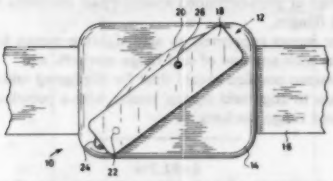
Paul S. Phelps, Maryville, Tenn., assignor to Star Sales Company, Inc., Knoxville, Tenn.

Filed Mar. 21, 1983, Ser. No. 476,920
Int. Cl.³ B26B *3/06*
U.S. Cl. 30—151 **12 Claims**

1. A folding knife unit having a releasible knife which comprises:

a folding knife having a first and further side plate, at least

one back spring interposed between and attached to said side plates, and at least one knife blade in conventional biasing contact with said back spring interposed between said side plates and pivotally joined to said side plates at a first end thereof, said first side plate having first and further ends and provided with an aperture through said first side plate at a location substantially disposed from said first end, and wherein said blade is provided with an aperture proximately aligned with said aperture of said first side plate when said blade is disposed between said side plates; and



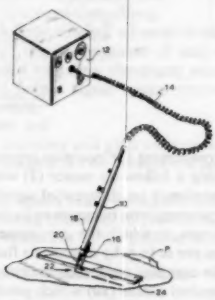
a base having a substantially planar surface with first and further opposite ends, provided with attachment means projecting from said surface proximate said first end, contoured for releasible engagement with said first end of said first side plate and a first stud projecting from said surface positioned and contoured for engagement with said aperture in said first side plate and said aperture in said blade when said first end of said first side plate is engaged with said attachment means.

4,481,713

RECIPROCATING DRAFTING PEN

David C. Howell, 333 Hook Rd., Katonah, N.Y. 10536

Filed May 27, 1983, Ser. No. 498,847
Int. Cl.³ B43C *13/02*
U.S. Cl. 33—39 B 14 Claims



1. Drafting pen apparatus suitable for stippling or drawing interrupted lines comprising a barrel; piston means disposed within said barrel and longitudinally movable therein over a stroke length; a drawing pen device attached to said piston means and movable therewith having an ink reservoir and a pen nib extending out one end of said barrel for applying ink to a medium when the nib is in contact therewith; a guide foot at said one end of the barrel, extending generally axially relative to the barrel, and adjustably connected thereto for maintaining a desired standoff of said one end the barrel from the surface of said medium; and electromechanical drive means for longitudinally moving said piston means, and with it said drawing pen device, such that said nib is brought into contact and out of contact with said medium.

4,481,714

AUTOMATIC PIPE TALLY DEVICE

Stephen C. Nelson, 407 McKelvey Ave., Bakersfield, Calif. 93308

Filed Jan. 31, 1983, Ser. No. 462,366
Int. Cl.³ G01B *5/04*
U.S. Cl. 33—141 R 2 Claims

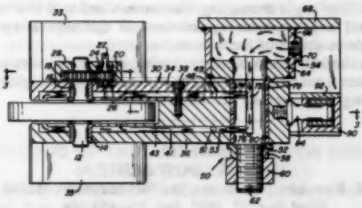
1. An automatic pipe tally device for measuring the length of a string of tubular members connected to one another by a collar, comprising in combination a mounting plate, a protective cover plate secured to said mounting plate, three tubing engaging assemblies secured to said mounting plate for holding said tubing being measured in the center of said measuring device, each of said tubing engaging assemblies including a rotatable wheel and a compression spring for pushing into engagement with said tubular member being measured, and a pair of linear footage counters secured to said mounting plate, said mounting plate and said protective cover plate being composed of two halves, defining a pair of central openings which encompass the tubing or pipe to be measured.

4,481,715

MEASURING WHEEL

David L. Gilmore, 219 Sycamore, Highlands, Tex. 77562

Filed Feb. 4, 1983, Ser. No. 463,742
Int. Cl.³ G01B *3/12, 7/04*
U.S. Cl. 33—141 B 8 Claims



1. In a wheel apparatus for measuring a dimension of an elevated temperature surface, said apparatus including a wheel for making rolling contact with said surface, means for rotatably mounting said wheel, an elongated arm having said wheel and wheel mounting means mounted adjacent one end of said arm, means pivotally mounting said arm at an end of the arm opposite from the end on which said wheel is mounted, said arm being pivotally movable from a first position in which said wheel does not make contact with the elevated temperature surface to a second position in which said wheel does make rolling contact with said surface,

the improvement in which said apparatus further comprises:

said arm and arm mounting means having at least one pair of mateble passages for transport of cooling fluid and for directing said fluid to said wheel for the cooling thereof, said passages registering only when said arm is pivoted to the second position thereof, thus permitting

flow of said fluid only when the wheel is in rolling contact with the elevated temperature surface.

4,481,716

WHEEL ALIGNMENT MEASURING APPARATUS

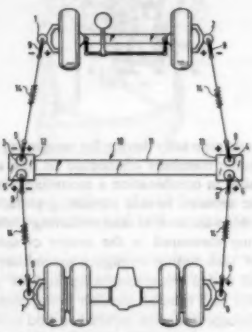
Osmond Beissbarth, Sulzbacher Strasse 15, 8000 München 40, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,293

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206646

Int. Cl.³ G01B 5/255, 7/315

U.S. Cl. 33—203.18 19 Claims



1. A wheel alignment measuring apparatus including four angle measuring instruments for mounting on front wheels and rear wheels of a vehicle, and including a calculation circuit for the determination of track measuring values comprising:

a measuring bridge being operatively provided essentially transversely to the driving direction and being positioned approximately between the front wheels and the rear wheels;

four additional angle measuring instruments, two being operatively arranged on one side and two being operatively arranged on the other side of the measuring bridge;

elastic tension means being operatively connected between said four angle measuring instruments and said four additional angle measuring instruments for measuring the angle positions of the wheels;

said calculation circuit determining the track measuring values from comparing angular positions of all angle measuring instruments.

4,481,717

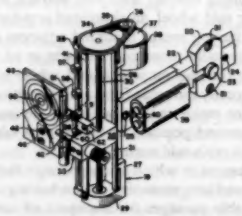
ARCHERY BOW SIGHT

Robert J. Kowalski, 512 Berner St., Pittsburgh, Pa. 15215

Filed Jan. 27, 1983, Ser. No. 461,646

Int. Cl.³ F41G 1/00

U.S. Cl. 33—265 19 Claims



1. A sight for aiming a bow comprising, in combination:

an elongated frame adapted to be secured to the bow above the arrow-receiving portion thereof, said frame having upper and lower flange portions,

a threaded shaft arranged vertically for rotatable support by said flange portions,

a sighting means threadedly supported on said shaft, said sighting means including a stylus horizontally spaced from a transparent lens having a plurality of field range markings to establish a target distance by selecting one of said markings in a line-of-sight with said stylus and a target,

a carrier supported by said frame to extend generally parallel to said shaft,

a plurality of range markers adapted for support by said carrier at predetermined spaced-apart locations between said flanges,

marker means supported by said sighting means for alignment with any one of said range markers, and

drive means coupled to said shaft for displacing said sighting means to align said marker means with a preselected one of said range markers.

4,481,718

ADJUSTING ARRANGEMENT FOR COMPASS REPEATERS

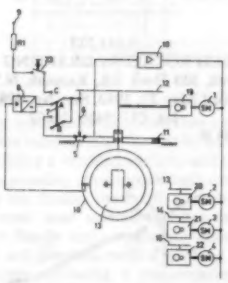
Dieter Werblinski, and Heino Hoffmann, both of Kiel, Fed. Rep. of Germany, assignors to Anshütz & Co. GmbH, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 496,820

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219169

Int. Cl.³ G01C 19/36

U.S. Cl. 33—317 R 5 Claims



1. Adjusting arrangement for compass repeaters of a gyrocompass, comprising a follow-up motor (1) which effects the adjustment in dependence on differential signals between the north-indicating gyromagnetic compass and a bowl (18) enveloping the gyro-system, in which the gyro-system is supported in a manner known per se (e.g. by means of a fluid bearing) and is connected to the compass card, characterized by

(a) electronic control means (10) which produces from said differential signals a corresponding pulse sequence for stepping motors,

(b) substantially identically designed stepping motors (1 to 4) which in response to the pulse sequence produced by the electronic control means (10) synchronously adjust the compass cards of master compass and compass repeaters, wherein a reduction gear unit is preferably interposed therebetween,

(c) a per se known sliding contact (11) connected to the compass card of the master compass, said sliding contact being in wiping contact with a brush (6) and including an interruption point (5),

(d) an adjusting power supply (9) for supplying an adjusting current to the brush (6) so that, when the follow-up switch (7) is in the OFF state, the compass cards are adjusted via the stepping motors (1 to 4) of the master compass and the

compass repeaters until the interruption point (5) is contacted by the brush (6).

4,481,719

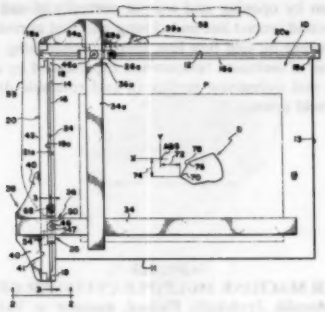
DRAFTING APPARATUS

Roger Grover, 1605 Treanor St., Saginaw, Mich. 48601

Filed Jan. 3, 1983, Ser. No. 455,428

Int. Cl.³ B43L *13/02*

U.S. Cl. 33—437 **1 Claim**



1. Drafting apparatus for measuring any selected one of a plurality of various different coordinates of a mechanical drawing surface on a drafting table, said apparatus comprising:

first and second normally disposed straight edge means for overlying said table;

first and second slide means mounting said first and second straight edge means respectively, for sliding movement on said table in to-and-fro perpendicularly disposed paths of travel;

means coupling said first and second straight edge means to said first and second slide means, respectively, including:

means for selectively clamping said first and second straight edge means to said table to selectively inhibit said to-and-fro movement; and

a measurement system comprising:

read head means mounted on each of said slide means for measuring the displacement of said elongate straight edge means including transducer means for providing electrical output signal means representative of said displacement;

a glass scale; and

means for mounting said glass scale on said drafting board so as to define a slot for receiving a portion of said slide means;

said read head means being juxtaposed with said glass scale and cooperating therewith to provide an electrical output signal representative of the position of said straight edge means.

4,481,720

COMBINED LEVEL AND PROTRACTOR WITH CALIBRATION FEATURES

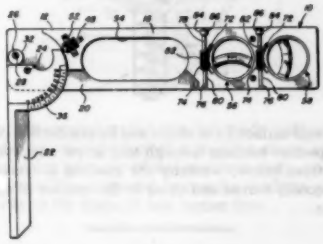
Francis P. Sury, 12720 Highway 92, Dover, Fla. 33527

Filed May 9, 1983, Ser. No. 492,566

Int. Cl.³ B43L *7/06*

U.S. Cl. 33—451 **7 Claims**

1. A combined level and protractor assembly including an elongated body comprising a pair of laterally abutted elongated opposite side body members, the opposing sides of said body members defining one end of said body including opposing recesses formed therein together defining a cavity opening endwise outwardly of said one end and through one longitudinal edge of said body along the latter from said one end to points spaced therealong toward the other end of said body, an elongated protractor arm having one end thereof pivotally supported within said cavity for angular displacement of said arm relative to said body between an extended position projecting outwardly of said one edge at 90° relative thereto and a retracted position received within the portion of said cavity extending along said one edge, spirit level assembly means carried by the other end of said body, the ends of said body members defining the other end of said body including opposing sockets formed therein, said spirit level assembly means including mounting frame means captively received in said sockets, the portions of said members defining said sockets having transverse window openings formed therethrough registered with said sockets for viewing said spirit level assembly means from the outer sides of said members, said body members being removably secured together through the utilization of threaded fasteners secured through one of said body members and threadedly engaged relative to the other body member, said frame means being clamped between the portions



of said members defining the inner extremities of said sockets, control means operable to adjustably limit swinging movement of said arm toward the extended position thereof, said control means comprising a cam rotatably mounted from said body members, disposed in said cavity and engageable by said arm for limiting swinging thereof toward said extended position, said cam including a journal shaft portion received through a journal bore provided therefor in one of said body members and engageable from the exterior of said body to rotate said shaft portion, and thus said cam, said cam being releasably clamped in adjusted position between said body members and within said cavity upon the tightening of said threaded fasteners, said body members including registered handhold defining transverse openings formed therethrough, the end portion of said cavity remote from said one end of said body opening into both said openings through the sides thereof adjacent said one longitudinal edge of said body.

4,481,721

METHOD OF AND AN APPARATUS FOR DRYING PULVERULENT MATERIALS

Roderich W. Gräff, Kollwitzweg 19, 6100 Darmstadt-Arheilgen, Fed. Rep. of Germany

Continuation of Ser. No. 912,037, Jun. 2, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 126,826

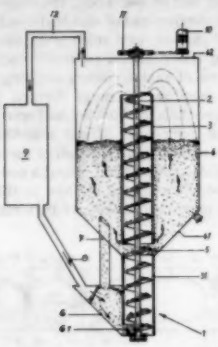
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2725839

Int. Cl.³ F26B *3/16*

U.S. Cl. 34—33 **10 Claims**

1. A method of drying particulate, especially pulverulent, materials, comprising the steps of collecting a quantity of the respective material to be dried in a silo; providing in said silo a rotating screw conveyor having a plurality of turns spaced from one another and forming therebetween a confined space; introducing a quantity of the material from said silo which is determined by the rate of rotation of said screw conveyor, into said screw conveyor so that only a portion of said confined space is filled thereby forming another portion of said confined space which is empty and so that when said screw conveyor rotates said quantity is conveyed along the latter with said another portion remaining free and unobstructed whereby said

quantity has an exposed surface; and passing a drying gaseous medium through said screw conveyor so that it passes through said another portion of said confined space of said screw conveyor thereby contacting said exposed surface while simultaneously heating the material, both through direct contact on said exposed surface from above and by conduction of the heat of said gaseous medium through said screw conveyor to said portion from below, whereby the material is conveyed and simultaneously stirred and dried in the interior of said screw conveyor.

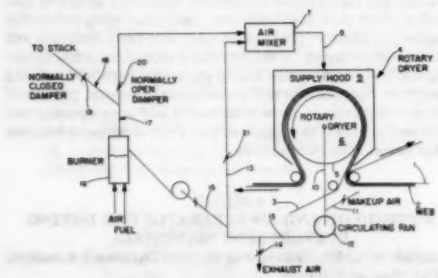


4,481,722

SYSTEM FOR PROTECTING A ROTARY DRYER FROM THERMAL STRESS

Fredrick A. Guy, Appleton, Wis., and Robert S. Ball, Etobicoke, Canada, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 23, 1982, Ser. No. 391,368
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—47 **7 Claims**



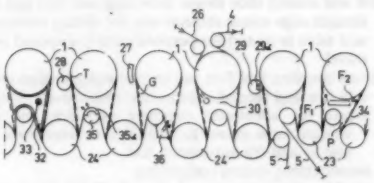
1. A system for drying a wet web of fibrous material carried through a rotary dryer on an air pervious support, without damage to the rotary dryer or the air pervious support in the event of an upset to the system, comprising in combination: (1) heater means for producing hot air; (2) a dryer unit comprising (a) an air input section having a supply hood partially enclosing the exterior, air pervious, cylindrical surface of a rotatable drum which carries said support and (b) an air output section, said dryer unit so constructed and arranged as to dry said web by passing hot air through said web, then said support and then said cylindrical surface in a transpiration dryer section; (3) an air mixer for mixing at least a portion of the air exiting said air output section with the hot air produced in said heater means and supplying the mixture of air to said air input section; (4) recycle means for carrying at least a portion of the moist air exiting said air output section of said dryer unit to said air mixer, said recycle means including (a) an outlet for moist exhaust air; (b) an inlet for make-up air; and (c) an outlet for directing a portion of the moist air to said heater means; (5) a first line for carrying said hot air from said heater means to said air mixer; (6) a first normally open damper means on said first line; (7) a second line for venting said hot air away from the system; and (8) a second normally closed damper means on said second line, and wherein upon the onset of an upset in said system, the hot air produced by said heater means and normally carried to said air mixer for mixing with said portion of the air exiting said air output section can be vented away from the system by opening said second normally closed damper means on said second line and closing said first normally open damper means on said first line, thereby minimizing the time and degree of increased temperature experienced by said support and said cylindrical surface of said rotatable drum as a result of said upset.

4,481,723

PAPER MACHINE MULTIPLE CYLINDER DRYER

Timo Vedenpiää, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Filed Nov. 24, 1981, Ser. No. 324,862
Claims priority, application Finland, Dec. 1, 1980, 803720
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—114 **17 Claims**



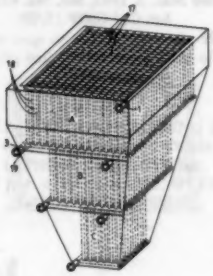
1. In a paper machine multiple cylinder dryer having a plurality of drying cylinders, a drying fabric on which a web is adapted to be supported to pass from one cylinder to another in closed conduction, said drying fabric having a cyclic looped run wherein some of said drying cylinders remain within the loop of said supporting fabric and others of said drying cylinders remain outside said loop, a plurality of guide rollers and a supporting fabric guided by said guide rollers and supporting said web on at least some of said cylinders, the runs of said web in said dryer supported by said drying fabric, the free surfaces of said drying cylinders and the runs of said supporting fabric defining in conjunction with said cylinders elongated pockets, and pressure control means for providing an over-pressure higher than the ambient atmospheric pressure in said pockets at least in the initial part of said dryer in the direction of travel of said web, the improvement comprising:

said pressure control means is constituted by means for providing a pumping action by said supporting fabric, and further including web detachment means situated within said drying fabric loop adjacent to an opening throat region defined between a respective cylinder contacted by the web and a portion of the web-carrying drying fabric for creating a slight localized sub-atmospheric pressure acting to urge the web toward said drying fabric as the web is detached from said cylinder to insure detachment of the web from the cylinder and that the web follows along with said drying fabric.

4,481,724
DEVICE FOR DRYING AND PREHEATING COKING COAL

Vladan Petrovic, and Heinz Dürselen, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 20, 1982, Ser. No. 370,124
Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3117967
Int. Cl.³ F26B *17/14*
U.S. Cl. 34—168 **2 Claims**



1. A device for drying and preheating coking coal in a turbulent layer by means of an indirect heat exchange with a heating medium, comprising a plurality of superposed containers interconnected in cascade for passing downwardly the coal to be treated; each of said containers housing at least one array of vertically oriented heating pipes; each container defining a bottom region provided with means for imparting a turbulent flow to the coal; each of said containers defining a bottom region with a downwardly converging walls and enclosing a plurality of superposed arrays of heating pipes, each array having a separate intake conduit and a separate discharge conduit for the heating medium; said means for imparting a turbulent flow to the coal including a plurality of horizontally oriented pipes arranged side-by-side and provided with an intake port for a pressure medium and with a plurality of discharge openings for the pressure medium which imparts the turbulent movements to the coal; and said horizontally oriented pipes including upwardly directed end portions extending along the inner wall of the assigned container, said upwardly directed portions being provided with discharge openings.

4,481,725
MOCCASIN

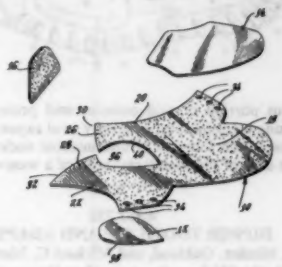
Charles Bergmans, Sprang Capelle, Netherlands, assignor to Clarks of England, Inc., Norwalk, Conn.

Filed Feb. 22, 1982, Ser. No. 350,749
Int. Cl.³ A43B *3/14*
U.S. Cl. 36—11 **16 Claims**

1. An improved moccasin to be worn on a human foot, the moccasin comprising:

a moccasin body including a bottom sole for underlining said foot, said sole curving upwardly about the sides of said foot and the periphery of said toes to form left and right sidewalls of said moccasin, said left and right vertical sidewalls each having a rear portion, said rear portions being secured together, and in conjunction with said sole forming a heel cup, said heel cup having a generally horizontal sole portion for underlying said foot, said sole portion including an opening defined by an edge extending around said opening;

a horizontal sole insert secured in said opening, said insert including a peripheral edge abutting said opening edge to thereby provide a substantially smooth, continuous upper surface for the foot heel to rest upon and a smooth continuous transition between said horizontal sole inset and said vertical left and right sidewalls, said abutting of said peripheral edge and said opening edge located closely adjacent said horizontal to vertical transition in said heel cup; and

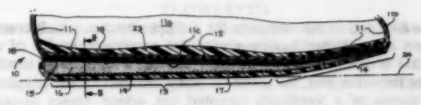


an outer sole secured to said moccasin body, said outer sole including in the top thereof a concave cavity receiving and retaining said sole of said moccasin body, said cavity being smoothly contoured to thereby conform generally said sole to the shape of said human foot.

4,481,726
SHOE CONSTRUCTION

Edward H. Phillips, Middletown, Calif., assignor to American Fitness, Inc., Sunnyvale, Calif.

Filed Apr. 7, 1980, Ser. No. 137,581
Int. Cl.³ A43B *13/12*
U.S. Cl. 36—30 A **4 Claims**



1. In a shoe construction including a shoe upper having side, top and bottom portions arranged to enclose a person's foot therein, a mildly rigid liner disposed upon the top of said bottom portion within said upper, and a sole construction secured to the undersurface of said bottom portion, said sole construction comprising an elongate trailing section and a forward section disposed to extend in advance of said trailing section, said trailing and forward sections including a mid-sole of compliant material, and means for imparting substantial inflexibility to said trailing section in a vertical plane while permitting said forward section to flex with respect to said trailing section.

4,481,727
SHOE SOLE CONSTRUCTION

Jerry D. Stubblefield, Portland, Oreg., assignor to Pensa, Inc., Portland, Oreg.

Division of Ser. No. 147,140, May 6, 1980, Pat. No. 4,335,530. This application Jun. 21, 1982, Ser. No. 390,380
Int. Cl.³ A43B *13/12*
U.S. Cl. 36—83 **29 Claims**

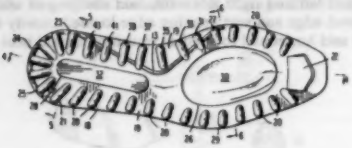
1. A shoe, which comprises:

an upper;

an outsole made of a material having a first density and including at least one generally oval cutout portion formed therethrough under the metatarsal arch portion of the foot of a wearer; and

a midsole made of a material having a second density less

than said first density and positioned between said upper and said outsole, said midsole including a lower surface having a protruding portion that extends through said



cutout portion of said outsole, said protruding portion forming a continuous, generally oval expanse that is positioned in the forepart of said midsole under the approximate area of the metatarsal arch of a wearer.

4,481,728

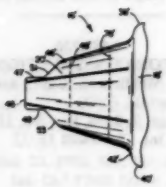
DIPPER TOOTH TIP AND ADAPTER

James P. Mulder, Oakland, and Michael C. Meslink, Franklin Lakes, both of N.J., assignors to Abex Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 326,214, Dec. 1, 1981, abandoned. This application Aug. 25, 1982, Ser. No. 411,168

Int. Cl.³ E02F *9/28*

U.S. Cl. 37—142 A **1 Claim**



1. An adapter tip assembly for a dipper bucket which comprises an addapter having means for receiving the lip of a bucket at one end and means for receiving a replaceable tooth tip at the other end, the tooth tip being retained on the adapter by means of a vertically oriented pin which resists forces tending to twist the tooth tip off the adapter, said adapter being shaped to minimize the stress of said forces on said pin and distributing stresses on the adapter equally in all directions, the shape of said adapter being defined by:

a nose having a circular base at the rear portion, an outer surface forwardly of said circular base of substantially linear ellipsoidal shape and tapering toward a front portion having the shape of a horizontal ellipse, said horizontal ellipse having elliptical side surfaces joined by a pair of parallel upper and lower horizontal surfaces which merge into the elliptical side portions of the front portion of the tooth tip which horizontal surfaces project rearwardly from the front portion and merge into angled surfaces which extend rearwardly and outwardly and merge into said surface of linear ellipsoidal shape, said angled surfaces each being bounded by a curved line where they join said surface of linear ellipsoidal shape, and a straight line joining the ends of said curved line, said straight line being the juncture between the rear edge of said horizontal surfaces and the forward edge of said angled surfaces, and a vertically oriented pin-receiving hole formed in said outer surface;

and a tooth tip having a front surface and a back end, a socket formed in the back end which substantially complements the adapter nose and includes a pair of parallel horizontal surfaces which extend the width of the nose front portion such that the tooth tip fits securely on the adapter and engages substantially the entire outer surface of the adapter nose, and a pair of pin receiving openings formed in the back end of the tooth tip which openings are aligned with said hole when the nose is received in the socket; said outer surface of ellipsoidal shape and the horizontal ellipse at the front of the adapter serving to distribute stresses on the tip toward equality in all directions while said horizontal surfaces reduce stress on the pin when the assembly is used to dig.

4,481,729

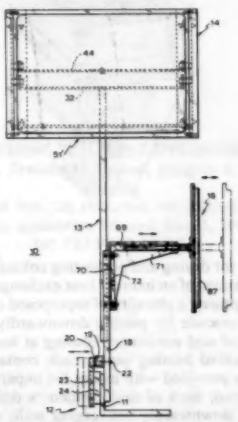
OVERHEAD AND FASCIA SIGN

Peter J. Weiller, Armonk, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.

Filed Mar. 2, 1983, Ser. No. 471,229

Int. Cl.³ G09F *15/00*

U.S. Cl. 40—606 **11 Claims**



1. A display device comprising a vertical support structure including at its upper end a pair of longitudinally spaced transversely extending parallel support members terminating at their outer ends in separable coupling sections and at its lower end means for mounting said support structure, said support structure including a pair of longitudinally spaced brackets between the top and bottom thereof having forwardly projecting parallel guide legs, quadrilaterally arranged vertical corner member releasably coupled to respective support members coupling sections and having on their outer faces first separable fastening means, fascia panels extending between pairs of said corner members and having on their rear faces second separable fastening means releasably engaging said first fastening means, an arm supported by and adjustable along each of said guide legs and terminating at its free end in a first coupling members and a fascia panel extending between said first coupling members and having second coupling members releasably engaging said first coupling member.

4,481,730

SPRING OPERATED ANIMAL TRAPS

Jack G. J. Dickinson, 4 Weymar St., Cheltenham 3192 Melbourne, Victoria, Australia

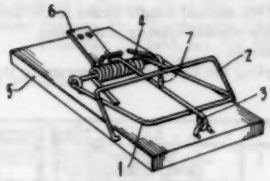
Filed Feb. 3, 1982, Ser. No. 345,218

Int. Cl.³ A01M *23/30*

U.S. Cl. 43—81.5 **1 Claim**

1. I claim a trap comprising a base, a spring urged bail pivoted to the base, a releasable catch arm pivoted to the base and adapted to engage a trip member mounted on the base and to thereby retain the bail against the tension of the spring, said

catch arm having a step or notch formed therein, and a manually rotatable loop pivoted on the base and extended across the



bail to engage the step or notch when the catch arm is in position to retain the bail against the tension of the spring.

4,481,731

AMUSEMENT DEVICE FOR MAKING BUBBLES

John E. La Fata, Oxnard, and John D. Cuccio, Ojai, both of Calif., assignors to Product Originators, Inc., Oxnard, Calif.

Filed Apr. 6, 1983, Ser. No. 482,634

Int. Cl.³ A63H *33/28*

U.S. Cl. 446—15 **7 Claims**

1. An amusement device comprising a wand and a pan for use in making bubbles, said wand having:

(a) an outer ring disposed in a first plane;

(b) an inner ring disposed in a second plane generally parallel to and spaced from said first plane;

(c) an arm connecting said outer ring to said inner ring, said arm having a leg at either end thereof respectively connected to said inner ring and to said outer ring, said legs each being disposed generally transversely to the planes of said rings whereby said rings may be loaded with bubble making solution from a pan having separate reservoirs at different levels for receiving and loading said spaced rings; and

(d) a handle,

said pan having a pair of bubble making solution reservoirs of generally complimentary size and shape to said outer and inner rings of said wand for receiving said rings.

4,481,732

FRESH FLOWER HOLDER

Joseph S. Gallo, 58 Peach St., Walpole, Mass. 02081

Continuation of Ser. No. 337,539, Jan. 7, 1982, abandoned. This application Oct. 20, 1983, Ser. No. 543,915

Int. Cl.³ A01G *5/00*

U.S. Cl. 47—55 **8 Claims**

1. In a holder for at least one element of living corsage material from which substantially the entire stem has been severed, said holder including a covered wire, a portion of absorbent material surrounding an intermediate portion of the covered wire to form a moisture reservoir, and a water-repellent covering surrounding said absorbent material and extending down said wire, the improvement wherein said absorbent material comprises a plug of random fibers of synthetic material organized generally uniformly in density throughout the plug in which the fibers extend predominantly parallel to said covered wire, whereby said fibers are capable of spreading generally radially outward to permit insertion of the severed

end of said living material into said plug and are capable of providing a radially-inward restoring tendency so as to keep said material from breaking its moisture-supplying contact with the plug, and whereby said fibers are capable of being spread transversely at a location spaced from said wire to permit insertion and retention of a second element of living corsage material such as a piece of foliage.

4,481,733

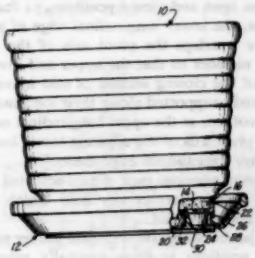
FLOWERPOT

Daryl E. Jacobs, 16962 Lark, Huntington Beach, Calif. 92649

Filed Aug. 5, 1983, Ser. No. 520,550

Int. Cl.³ A01G *9/04*

U.S. Cl. 47—71 **6 Claims**



1. In a flower pot which is adapted to grow plants having a body provided with a bottom and a side wall structure attached to said bottom and extending upwardly from the periphery of said bottom the improvement which comprises:

a downwardly opening, water impervious recess formed in said body and extending upwardly from said bottom generally towards the interior of said container, and

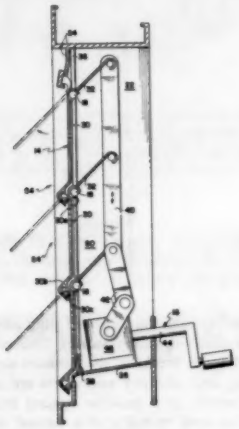
holding means within said recess, separate from said body of said flower pot and being moveable with respect to said body without disturbing the function of the flower pot for use in holding an object generally within said recess, said holding means being operatively associated with said bottom.

4,481,734

LOUVER ASSEMBLY

George J. Vaida, Guadalquivir 153, El Paraiso, Rio Piedras, P.R. 00926

Filed Jul. 19, 1982, Ser. No. 399,488
Int. Cl.³ E06B 7/08
U.S. Cl. 49—92 **9 Claims**



1. A louver assembly comprising:
a frame including vertical side jambs, a head, a sill, and a central opening;
a plurality of vertically-spaced, substantially-straight horizontal louver members extending longitudinally across said central opening between said side jambs, each of said louver members including a closing section and an actuating section, and each of said closing sections including upper and lower longitudinal edges;
means for pivotally mounting each of said louver members on said side jambs about respective pivot axes;
actuating means attached to the actuating section of each of said louver members for pivoting said louver members between open and closed positions, so that in said closed position, the lower longitudinal edge of an upper louver member overlaps the pivot axis of the adjacent lower louver member so that the upper and lower longitudinal edges of the closing section of said louver members are completely supported along their longitudinal lengths by said pivot axis at the upper longitudinal edge thereof and by the pivot axis of the adjacent lower louver member at the lower longitudinal edge thereof;
in said closed position, each of said actuated sections form a trough which receives any fluid which penetrates said louver assembly; and
said side jambs cooperate with said louver members in their closed positions to form vertically extending drainage channels connecting the ends of said troughs to provide drainage of fluid away from said troughs.

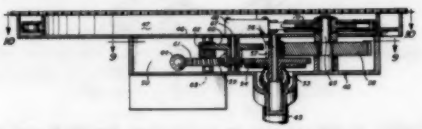
4,481,735

VENTILATING SKYWINDOW

Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Filed Sep. 3, 1982, Ser. No. 414,597
Int. Cl.³ E05F 11/00
U.S. Cl. 49—325 **10 Claims**

1. An operator for a skylight or the like comprising:
a housing,
means securing the housing to the skylight,
drive gear means in the housing for driving a means for causing the skylight to open and close,
manual handle means,
means coupling the manual handle means to the drive gear means to enable manual opening and closing,
electric motor means,
and means coupling the electric motor means to the drive gear means,



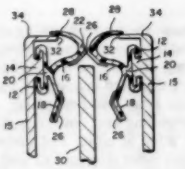
said drive gear means including a plurality of sequentially operated gears one of which has the manual handle means coupled thereto and another one of which has the electric motor means coupled thereto,
and means for rotationally supporting said plurality of gears with the one and another gears being supported by separated parallel-disposed spaced support shafts and with the one and another gears being arranged in parallel planes.

4,481,736

SEAL MEANS FOR SEALING A PANEL MOVABLE THROUGH AND FROM A SLOT

Edward W. Norton, Holcomb, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,441
Int. Cl.³ E05F 11/38
U.S. Cl. 49—373 **7 Claims**

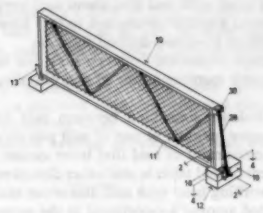


1. Seal means for sealing the space between a panel and a slot as the panel is moved through and from the slot comprising:
a structural member defining an elongated slot;
a panel movable through and from said slot; and
a longitudinally extending seal member having a base mounted on said structural member, said seal member further having a pair of diverging flexible arms, each of said arms having a layer of resilient pile material attached thereto for engaging the surface of said panel, said arms hingedly connected at a common edge portion thereof to said base and biased in one direction, said arms being pivotally movable in unison in the opposite direction against the bias of said arms between first and second positions in response to movement of said panel through and from said slot respectively whereby in said first position, both of said arms are in sealing engagement with a surface of said panel, and in said second position, one of said arms closes said slot and said other arm cooperates with said panel to prevent undue lateral movement of said panel.

4,481,737
PIVOTING GATE

James R. Rebhan, Onalaska; John C. Rebhan, and Arthur Hallstrom, both of LaCrosse, all of Wis., assignors to National Enclosure Systems, Inc., Worthington, Ohio

Filed Apr. 12, 1984, Ser. No. 599,547
Int. Cl.³ E05D 7/00
U.S. Cl. 49—385 19 Claims



1. A gate operator for a gate of the vertically pivoting type which has a generally rectangular gate frame, comprising:

(a) rotatable pivot mounting means, adapted to be attached to the gate frame at a lower corner thereof, for supporting the gate frame for rotation about a horizontal pivot axis from a horizontal closed position to a generally vertical open postion;

(b) drive means for selectively applying torque to the gate frame to rotate the same between the open and closed positions;

(c) means for counterbalancing a substantial portion of the torque applied about the pivot axis by the weight of the gate frame when its center of gravity is over the closed position of the gate; and

(d) means for counterbalancing a substantial portion of the torque applied about the pivot axis by the weight of the gate frame when its center of gravity is over the open position of the gate including:

a base support,

a foot member adapted to be connected to the gate frame so as to apply torque thereto, the foot member extending away from the pivot axis and the gate frame,

at least one closing tension spring connected at one end to one of the foot member or the base support, and

means for selectively engaging the other end of the closing tension spring such that the spring is loose and relaxed when the center of gravity of the gate frame is over the closed position of the gate and firmly holding the end of the spring when the center of gravity of the gate frame is over the open position of the gate such that the spring is stretched and exerts a counterbalancing force on the foot member to provide a torque to the gate frame which counterbalances the torque applied by the weight of the gate frame.

4,481,738
GRINDING MACHINE

Shūji Tabuchi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki and Disco Abrasive Systems, Ltd., Tokyo, both of, Japan

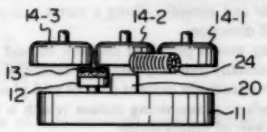
Continuation of Ser. No. 257,472, Apr. 24, 1981, abandoned. This application Sep. 6, 1983, Ser. No. 529,670
Claims priority, application Japan, Apr. 24, 1980, 55-54721
Int. Cl.³ B24B 9/00
U.S. Cl. 51—5 R 11 Claims

1. A grinding machine for grinding a surface of a thin plate-like workpiece, comprising:

a rotating table provided with at least a workpiece holder including a cup-shaped body being secured to the table and having a hollow interior portion, and a top plate attached to said body and closing the top opening of said body, said top plate being made of porous material and having a top flat surface on which the workpiece is placed and held, the holder being detachably and non-rotatably secured to the table with said top surface protruding above the table surface;

vacuum means having a suction end member connected to and communicating with the interior hollow portion of the cup-shaped body for providing said workpiece holder with vacuum suction for holding the workpiece to the workpiece holder; and

a plurality of cup-shaped grinding wheels having different grain sizes ranging from coarse to fine with a first grinding wheel having a grain size of less than 1,000 mesh and a

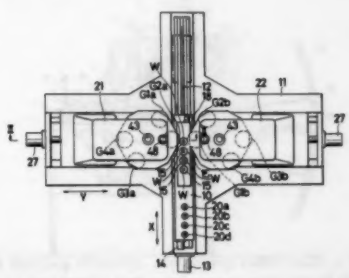


final grinding wheel having a grain size of more than 1,000 mesh, each of the grinding wheels being rotated about an axis inclined at a slight angle to the axis of rotation of the table, the grinding wheels being disposed above the table in a circular arrangement with respect to the axis of rotation of the table and located in different axial positions with respect to the axis of rotation of the table, wherein, as the table rotates, the surface of the workpiece held to the workpiece holder is successively ground by the first grinding wheel to the last grinding wheel so that a desired total thickness is ground and a desired surface finish is obtained in one rotation of the table.

4,481,739
GRINDING MACHINE WITH DUAL TURRETS

Ikuo Suzuki, Chiryu; Kunihiko Unno, Kariya, and Norio Ohta, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 21, 1982, Ser. No. 420,629
Claims priority, application Japan, Oct. 9, 1981, 56-161478
Int. Cl.³ B24B 9/00
U.S. Cl. 51—5 D 7 Claims



1. A grinding machine comprising in combination:

a bed;

work support means mounted on said bed for supporting a workpiece and movable in a first direction;

a first feed mechanism connected to said work support means for moving the same in said first direction;

a pair of wheel slides mounted on said bed at opposite sides of said work support means in a second direction perpendicular to said first direction and slidable toward and

away from said work support means in said second direction;

a pair of second feed mechanisms respectively connected to said pair of wheel slides for independently moving said wheel slides in said second direction;

a pair of turrets each supporting a plurality of grinding wheels respectively having circumferential grinding surfaces different from one another in profile, said turrets and grinding wheels being rotatable about respective axes extending in a third direction perpendicular to said first and second directions;

turret support means provided on each of said wheel slides for supporting an associated one of said turrets so that said associated one of said turrets is rotationally indexable about and movable along a turret axis extending in said third direction;

indexing means provided on each of said wheel slides for rotationally indexing said associated one of said turrets so as to selectively present ones of said plurality of grinding wheels to a machining station which is located between said pair of wheel slides;

a third feed mechanism provided on each of said wheel slides for moving said associated one of said turrets along said turret axis;

a plurality of dressing rolls disposed on said work support means linearly in said first direction and rotatable about respective axes extending in said third direction, said dressing rolls having at circumferential surfaces thereof different profiles respectively corresponding to said circumferential grinding surfaces of said grinding wheels supported by each of said turrets; and

a roll drive motor mounted on said work support means for rotating said plurality of said dressing rolls.

4,481,740

TOOL PROFILE GRINDING MACHINE, WITH MECHANICAL ADJUSTMENT OF THE GRINDING WHEEL AND POSITIONING OF THE TOOL INTERRELATED

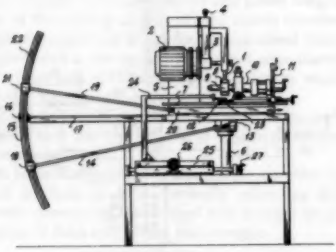
Gaspare Ballarini, Via Sigismondo, 33, Cattolica (Forlì), Italy

Filed Nov. 6, 1981, Ser. No. 319,053

Claims priority, application Italy, Nov. 14, 1980, 44027 A/80

Int. Cl.³ B24B *17/02*

U.S. Cl. 51—100 R **10 Claims**



1. A profiled tool shaping machine, comprising:

a machine frame;

a working head having a grinding disc rotatably mounted thereto about a disc axis and in a disc plane, said working head pivotably mounted to said frame about a vertical axis for horizontal pivoting of said disc and disc plane;

a work table slidably mounted to said frame for motion in at least two horizontal orthogonal directions with respect to said frame and said disc;

a work piece holder mounted to said table for holding a work piece adjacent said disc, which work piece is to be shaped into a profiled tool;

a dummy template having a profile corresponding to a profile of a tool to be shaped, fixed to said table;

a feeler fixable to said frame and engaging said template for causing motion of said table in one direction when said template with said table is moved past said feeler in another direction;

a first lever connected to said working head for pivoting said working head with said disc about said vertical axis;

a compensator member connected to said frame and having a plurality of positions defined thereon;

a first linkage connected between said first lever and said compensator member at one of said plurality of positions; and

a second linkage connected between said table and said compensator member at one of said plurality of positions so that, movement of said first lever causes simultaneous movement of said table in said other direction and rotation of said working head with said disc about said vertical axis by selected amount proportional to the movement of said table in said other direction.

4,481,741

POLISHING MACHINES INCORPORATING ROTATING PLATE

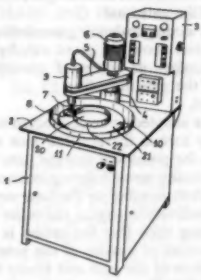
Gabriel Bouladon, Les Martinets B, 38610 Gieres, and Lucien Grisel, Les Combes, Herbeys 38320, both of France

Filed Feb. 15, 1983, Ser. No. 466,688

Claims priority, application France, Mar. 26, 1982, 82 05687

Int. Cl.³ B24B *5/00*

U.S. Cl. 51—131.1 **6 Claims**



1. In a polishing machine, of the type comprising a rotating workpiece-holder applied by force against a plate itself driven in rotation and sprayed with a suspension of abrasive, the upper face of the plate is hollowed out with a groove of circular section which defines two distinct concentric zones, separated from each other by a removable collar forming screen and of which the base is retained in the said groove, the latter being adapted to collect the slurries and abrasive liquids and to evacuate them through perforations.

4,481,742

MACHINE TOOL ELEVATING AND GUIDING APPARATUS

Masami Shimizu; Hisao Yoshikawa; Sosaku Kimura; Kazuo Shiba; Fumio Maeno; Shigehiro Fuwa, and Kuniyuki Mihara, all of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1983, Ser. No. 473,511

Claims priority, application Japan, May 12, 1982, 57-78312

Int. Cl.³ B24B *49/16*

U.S. Cl. 51—165.8 **2 Claims**

1. A machine tool elevating and guiding apparatus, comprising:

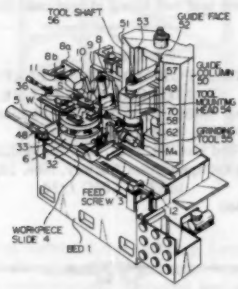
a bed having a pair of opposing guide columns fixedly mounted thereon, with a plurality of guide surfaces including at least one reference guide surface being formed on said guide columns;

a tool mounting head having a threaded bore provided therein and a plurality of guided surfaces formed thereon, said tool mounting head being positioned between said guide columns with each of said guided surfaces opposing and closely adjacent to a corresponding one of said guide surfaces;

means for supplying a flow of static pressure fluid passing between said guide and guided surfaces other than said reference guide surface and a guided surface opposed thereto;

a vertically extending elevating feed screw rotatably mounted on said bed, engaging with said threaded bore in said tool mounting head;

a static pressure bearing provided on said elevating feed



screw, said static pressure bearing including upper and lower static pressure chambers;

an actuating rod movably mounted on said guide columns and coupled to said tool mounting head;

load compensation means for sensing a difference between the pressures in said upper and lower static pressure chambers of said static pressure bearing, and responsive to said pressure difference for moving said actuating rod and thereby moving said tool mounting head vertically, in a direction such as to cancel said pressure difference, whereby the weight of said tool mounting head is effectively supported by said actuating rod;

drive means for rotating said elevating feed screw to selectively raise and lower said tool mounting head;

a tool shaft rotatably mounted in said tool mounting head;

drive means for rotating said tool shaft;

a machining tool fixedly mounted on said tool shaft, and;

workpiece retaining means for holding a workpiece in a fixed position below said grinding tool.

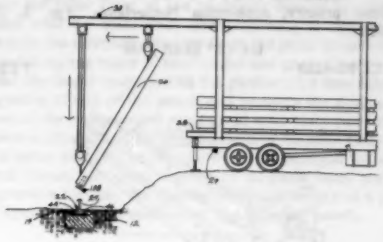
4,481,743

SYSTEM AND METHOD FOR CONSTRUCTING WALLS AND FOUNDATIONS EMPLOYING STRUCTURAL COMPONENTS

Stephen F. Jellen, 1421 N. 2nd St., Edwardsville, Ill. 62025

Filed Jan. 7, 1982, Ser. No. 337,686
Int. Cl.³ E04B *1/343*
U.S. Cl. 52—64 **34 Claims**

1. A system for erecting walls and foundations upon a base support from preformed structural components, comprising guidance means including channel means formed in the base support, a plurality of individual carrier assemblies independently engagable with the guidance means and movable therealong when engaged therewith, each of said carrier assemblies including component engaging means for engaging a structural component when the structural component is mounted thereon, said carrier assembly being movable when a structural component is engaged therewith to a desired location along said guidance means, each of said carrier assemblies further including clamping-type securing means operable when said carrier assembly and the structural component engaged therewith have been moved to the desired location to prevent further movement of the carrier assembly along the guidance



means, operation of said securing means effecting a tight clamping interengagement between said carrier assembly and said guidance means to secure the carrier assembly and the structural component engaged therewith in place at the desired location.

4,481,744

BUILDING STRUCTURE

Owen H. Park, Carmel, Ind., assignor to Heartland Industries, Inc., Carmel, Ind.

Filed Mar. 3, 1982, Ser. No. 354,511
Int. Cl.³ E04D *11/02*
U.S. Cl. 52—92 **9 Claims**

1. A building structure, comprising outer walls, a foof including a low border that overhangs at least one of the outer walls, a frame for supporting the outer walls and roof, the frame including a plurality of spaced-apart studs and a frame member forming an upper portion of the one outer wall, the frame member having a top edge adjacent the roof and a bottom edge, means for securing the frame member to the studs to provide strength and rigidity of the frame, a wall panel secured to the studs adjacent the bottom edge of the frame member, the wall panel forming a lower portion of the one outer wall, and a roof support member on the top edge of the frame member to provide support for the lower border of the roof.

4,481,745

CEILING AND COUPLING ELEMENT FOR THE SAME

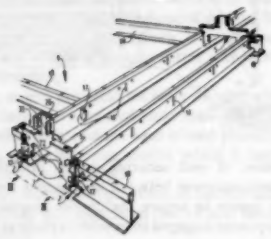
Johan G. Smits, Baarn; Johan A. de Weerd, and Cor K. Vuyk, both of Biaricum, all of Netherlands, assignors to Nemaco Trading Limited, St. Helier, Channel Islands

Continuation of Ser. No. 247,630, Mar. 25, 1981,. This application Jan. 24, 1984, Ser. No. 572,620

Claims priority, application Netherlands, Apr. 3, 1981, 8002018

Int. Cl.³ E04B 5/48

U.S. Cl. 52—220 7 Claims



1. In a suspended ceiling structure,

a grid system comprising a plurality of spaced, parallel girders each having an upstanding web and a horizontal flange joined with the bottom of the web, said webs being provided with a series of narrow, vertically elongate slots,

a plurality of spaced coupling members joining a pair of said girders, each coupling member having a main body portion of generally plate-like form disposed in a vertical plane perpendicular to said webs, said main body portion having a downwardly facing recess defining an upper portion of the main body which bridges between and overhangs said pair of girders, and a pair of depending limbs, each of said limbs having an outwardly projecting tab received in one of said slots of a respective one of said pair of girders and substantially filling the area thereof to stabilize against relative twisting motion between said coupling members and said webs, first means comprising a resilient hook struck out of each of said tabs for respectively passing through said slots and bearing against the outer sides of the webs of said pair of girders to force the webs of such girders inwardly into predetermined spaced relation, and second means on said main body portion of each coupling member for bearing against the inner sides of the webs both above and below said first means and laterally of said hooks to maintain the webs of said pair of girders at said predetermined spacing and to maintain said limbs in stabilized, perpendicular relation to said webs.

4,481,746

MINI-MODULE AND METHOD OF INSTALLING SAME TO FILL GAPS BETWEEN ADJACENT INSULATION MODULES

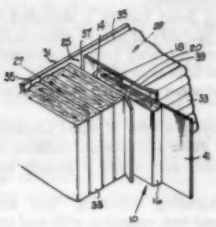
Anthony E. Cimochowski, Sedalia, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed Mar. 8, 1982, Ser. No. 355,823

Int. Cl.³ E04B 1/78

U.S. Cl. 52—404 4 Claims

1. A mini-module for insertion into gaps between adjacent refractory fiber insulation modules lining a furnace each of said modules having a generally standard thickness defined by a hot face positioned toward the furnace interior and a cold face positioned adjacent the furnace wall, said mini-module comprising a length of refractory fiber blanket which is twice folded to form a flattened generally C-shaped member with



two end edges being positioned adjacent one another at a point located between said hot face and said cold face.

4,481,747

ASSEMBLY FOR MOUNTING PLATES TO A FRAMEWORK STRUCTURE

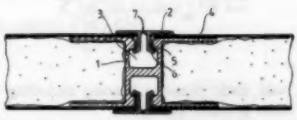
Paul Tengesdal, N-4387 Bjerkreim, and Sigbjörn Jensen, Raunevegen 5, N-4340 Bryne, both of Norway

Filed Oct. 28, 1982, Ser. No. 437,201

Claims priority, application Norway, Nov. 10, 1981, 813792

Int. Cl.³ L04C 1/34

U.S. Cl. 52—460 7 Claims



1. An assembly for mounting plates (4) to a framework structure wherein channel members (1) constitute the structural members of the framework and said channel members (1) are adapted to receive fastener members (2) for securing the plates (4) thereto, the plates (4) being firmly clamped to the framework structure by means of a latch connection between the fastener members (2) and the channel members (1) forming the framework structure, said channel members (1) being formed with a slot (3) having a narrow throat, and said fastener member (2) being formed with two substantially L-shaped rails (5) adapted to be positioned within the slot (3) and secured thereto, *characterized* in that the outermost, free section (6) of each of the two substantially L-shaped rails (5), which depend from the fastener member (2) and face in opposite directions, forms an obtuse angle with the inner section of the same rail, and that the fastener member (2) is slightly V-shaped and is adapted to be flattened or straightened out, whereby the outermost free section (6) of the rails (5) is pressed outwardly into engagement with the narrow throat of the slot (3) while at the same time the straightened fastener member (2) has full surface contact against the plates (4) and holds these very securely against the channel member (1).

4,481,748

SHORING SYSTEM AND PARTS THEREOF

Michael S. D'Alessio, Flushing, N.Y., and Robert S. Safier, Hackensack, N.J., assignors to Harsco Corporation, Camp Hill, Pa.

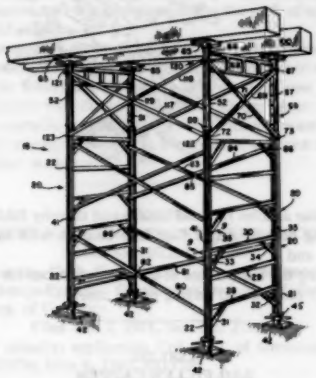
Continuation-in-part of Ser. No. 185,761, Sep. 10, 1980,. This application Sep. 1, 1981, Ser. No. 298,474

Int. Cl.³ E04G 1/12

U.S. Cl. 52—638 9 Claims

1. In an extendable shoring system, the improvement comprising a hollow aluminum base leg having a uniform cross-sec-

tion with walls shaped to give substantially greater lateral support in one direction than at right angles thereto, a hollow aluminum extension leg telescopically mounted to said base leg and have a plurality of transverse locating openings at spaced intervals along said extension leg, a plurality of support members in said locating openings engaging said base leg to fix said extension leg at a predetermined height on said base leg, and said locating openings being off-set sufficiently to permit a jack screw to be mounted on the extension leg without interference



from said support members, said openings further being defined by slots in the sides of said extension leg, said support members being comprised of a U-shaped load collar having channels formed in the arms thereof defining rails adapted to fit in said slots, and a support plate positioned on top of said base leg for supporting said load collar and said extension leg and serving to spread the load from said support members to the walls of said base leg, said plate having retaining legs engaging said collar so as to prevent said collar from spreading open.

4,481,749

PANELLING CLIP AND METHOD

Wilson M. Stirling, 11 Beenak Ave., East Brighton, Victoria, Australia

PCT No. PCT/AU81/00081, § 371 Date Mar. 2, 1982, § 102(e) Date Mar. 2, 1982, PCT Pub. No. WO82/00180, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 1, 1981, Ser. No. 355,738

Claims priority, application Australia, Jul. 2, 1980, PE4343

Int. Cl.³ E04B *1/38;* E04C *2/00*

U.S. Cl. 52—714 **4 Claims**

1. A clip for securing tongue and groove panel members to a supporting structure, the structure having a channel with re-entrant flanges, said clip being formed of resilient sheet metal and comprising a main body part to face against the outer faces of the re-entrant flanges of said channel, a plate extending out of the plane of the main body part and joined to the main body part by a central neck enabling the plate to be engaged within the channel with the neck between the re-entrant flanges thereof, said plate being severed from a central portion of said main body part whereby said body part has a pair of generally parallel sides joined at their ends by a cross bar, said sides being spaced to seat against the re-entrant flanges, said plate having tabs, one at each end to engage against the inner faces of the re-entrant flanges, a platform integral with the main body and projecting at right angles thereto in the direction opposite from the plate to extend between the mating edges of two tongue and groove panels, and at least one finger integral with the platform for insertion into the groove of one of the panels and between the tongue and groove of the interengaged panels, said main body part including means offset out of the general plane of the main body part in the same direction as the platform and arranged to be deflected toward the general plane of the main body part by compression between the channel and back surface of a panel for aligning the outer surfaces of two adjacent panels.

4,481,750

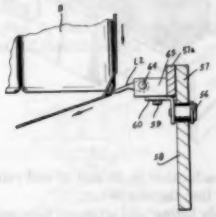
PACKAGING APPARATUS AND METHOD

Jack S. Cooley, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 6, 1981, Ser. No. 318,828

Int. Cl.³ B65B *21/24*

U.S. Cl. 53—398 **13 Claims**



11. A method of tightening a carrier blank about a group of articles said blank having openings spaced from its end edges and having tabs integral with the end portions of the blank and projecting into said openings, the method comprising the steps of moving the group of articles along a predetermined path with the blank disposed in overlying relation to the tops and sides of the group of articles and with the openings in the blank disposed adjacent the lower of the group of articles, imparting an inward and downward substantially frictionless force to said openings and to the parts of the blank adjacent the bottoms of the articles and between said openings on both sides of the blank by engaging the edge portions of said openings and said tabs and the portions of the blank which are intermediate said openings with tightening means having a substantially continuous tightening edge movable with the blank and articles so as to tighten the blank about the group of articles and to swing the ends thereof underneath the group of articles without imparting drag back force to the blank, and moving said tightening means in synchronism with the blank and articles and in the general direction of movement thereof but in a somewhat downward direction.

4,481,751

BAG BALING PROCESS

Gaspar Ujhelyi, Fairfield, N.J., assignor to Potdevin Machine Company, Teterboro, N.J.

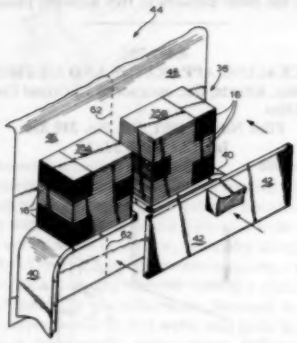
Filed Jul. 29, 1981, Ser. No. 288,140

Int. Cl.³ B65B *11/08, 35/52, 61/18*

U.S. Cl. 53—412 **8 Claims**

1. A method of providing a bale of bags which includes at least two separate but adjacent stacks of said bags, including the following steps:

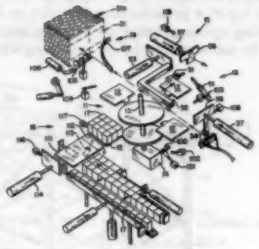
arranging said bags in stacks to form hands;
feeding hands of stacked bags one at a time to a first position on a stack elevator;
pushing the first of said hands from the first position laterally to a second position toward one end of the elevator;
elevating said first hand with the elevator to a stack support means;
repeating said pushing and elevating steps with at least one more hand so that said hands are stacked to form a first stack of hands on said support means;
pushing the ensuing hands one at a time from said first position laterally to a third position toward the other end of the elevator;
elevating said ensuing hands one at a time to said stack support means adjacent said first stack of hands to form a second stack of hands on said support means and thus forming separate first and second stacks of bags which are



adjacent each other in an end to end relationship defining a dividing line therebetween;
simultaneously lifting said adjacent first and second stacks of hands from said support means to a wrapping station;
providing wrapping material in said wrapping station and in a portion of said material a tear zone which facilitates the separation of said material; and
wrapping said wrapping material about the outside of said stacks to maintain the integrity of each stack and their adjacent position so as to form a single bale with said tear zone substantially adjacent said dividing line whereby a package of substantially bags is formed comprising at least two separate stacks of a plurality of bags positioned so as to have an edge of each stack respectively adjacent to each other and so that upon separating the bale along the tear zone each of the two stacks of bags are readily accessible.

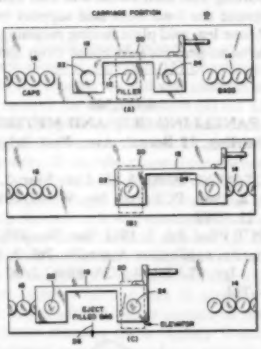
4,481,752
ROTARY CASE LOADING MACHINE
Herbert J. Sabel, 543 Avenue Del Oro, Sonoma, Calif. 95476
Filed Oct. 5, 1982, Ser. No. 432,965
Int. Cl.³ B65B *5/06*
U.S. Cl. 53—448 **22 Claims**

1. A method for loading articles into a case, comprising:
at an infeed station, feeding a plurality of articles, assembled in the configuration they are to be in when loaded in the case, onto a platform of a rotary carousel loading device, while holding an open-bottomed case with a case holding means on the carousel, above the platform;
rotating the carousel to move the platform to an offloading station while converging the platform and the open-bottomed case vertically toward one another such that the platform with the articles is moved fully into position in the case;
folding up bottom minor flaps of the case, against the bottom of the platform, with a central pedestal at the bottom of the platform positioned between the folded-up minor flaps;
moving the loaded case off the platform onto a surface at the same level, such that the platform slides out of the case



with the articles retained inside, and thereby folding up a leading bottom major flap, into contact with the minor flaps; and
conveying the loaded case to further operations for completion of closure and sealing of the case.

4,481,753
BAG FILLER-CAPPER
Christopher C. Rutter, Hayward, and Gerald R. Hill, Alamo, both of Calif., assignors to Champion International Corporation, Stamford, Conn.
Filed Dec. 17, 1981, Ser. No. 331,515
Int. Cl.³ B65B *31/06*
U.S. Cl. 53—471 **6 Claims**



1. A method of filling and capping containers, said method comprising the steps of:
(a) providing a filling station having a fixed nozzle for delivering a fluid to the containers;
(b) providing a shuttle which is reciprocally movable along a path between a first container engaging position, a second cap engaging position, and an intermediate position;
(c) providing vertically reciprocating elevator means for engaging containers;
(d) serially providing a supply of containers to said container engaging position, and a supply of caps to said cap engaging position;
(e) moving said shuttle to said container engaging position to engage one container with said shuttle from said supply of containers;
(f) subsequently moving said shuttle to said cap engaging position to engage one cap with said shuttle from said

supply of caps while simultaneously engaging said one container with said elevator means;

(g) subsequently moving said shuttle to said intermediate position to release said one container from engagement with said shuttle;

(h) subsequently raising said elevator means toward said fixed nozzle to engage the latter with a filling spout on said one container;

(i) filling said one container with a fluid via said nozzle;

(j) lowering said elevator means away from said fixed nozzle to dispose said one container below the path of movement of said shuttle;

(k) subsequently moving said shuttle to said container engaging position to engage a subsequent container with said shuttle while simultaneously moving said one cap into alignment with the spout on said one container; and

(l) subsequently moving said elevator means toward said one cap to engage the latter in the spout of said one container to close the latter.

4,481,754

EQUIPMENT FOR COVERING STACKED GOODS WITH SHRINKABLE HOODS

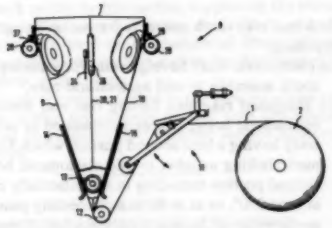
Rainer Hannen, Goch, Fed. Rep. of Germany, assignor to MSK-Verpackungs-Systeme Gesellschaft m.b.H., Kalkar-Wissel, Fed. Rep. of Germany

Filed Jul. 2, 1981, Ser. No. 279,844

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025576; May 9, 1981, 8113736

Int. Cl.³ B65B *9/10*

U.S. Cl. 53—567 **18 Claims**



1. Apparatus for pulling hoods made of shrinkable foil over stacks of wares comprising:

(a) a supply spool;

(b) a flattened foil sleeve wound upon said supply spool,

(c) said sleeve having a free openable end and being an end portion of a continuous tube having an external outer surface and an internal surface, in cross-section said tube comprised of a pair of mutually opposed walls, a pair of side walls connecting the opposed walls together with each side wall having at least one inwardly directed pleat therein mutually opposed walls and said side walls forming corner regions in said sleeve;

(d) mobile gripping means for gripping said free openable end of said sleeve and for drawing said sleeve from said supply spool;

(e) support means for contacting and guiding said external outer surface of said drawn sleeve;

(f) spreading means supported by said support means, receivable within said free openable end of said sleeve for engaging and spreading apart said opposed walls of said drawn sleeve;

(g) said spreading means comprising a first spreading structure including first guide disks positioned within said corner regions of said sleeve for internally guiding said sleeve and a pair of opposed, inwardly directed guide disks for externally engaging the pleats in said side walls, said first guide disks and said opposed guide disks having axes which are substantially coplanar;

(h) a welding and cutting device for subsequently welding a cross-seam in said spread apart sleeve at a location on said sleeve remote from said free end and for subsequently severing said sleeve at a location adjacent to said cross-seam thereby forming a separated hood having a spread apart opened end and a sealed end while providing the remaining portion of said sleeve with a newly formed, spread apart free end;

(i) said opened end of said hood being seized by said mobile gripping means for subsequent placement over a stack of wares; and,

(j) said mobile gripping means being subsequently engageable with said newly formed free end of said sleeve for drawing additional sleeve from said supply spool.

4,481,755

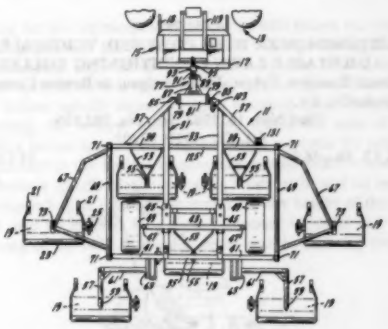
GANG MOWER TRAILER

Jack Carr, Glenview, Ill., assignor to Roseman Mower Corporation, Glen view, Ill.

Filed Jun. 9, 1983, Ser. No. 502,643

Int. Cl.³ A01D *35/12, 75/30*

U.S. Cl. 56—7 **3 Claims**



1. A hydraulically operated gang mower trailer connectable to a tractor having a source of pressurized hydraulic fluid, including:

a generally U-shaped frame having its open portion located at the front of the trailer,

a tow bar assembly having means at one end for connection to the U-shaped frame at the open portion thereof and means at the opposite end thereof for connection to a tractor,

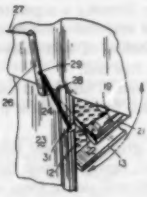
the tow bar assembly frame connection means permitting attachment to the U-shaped frame at different positions of vertical adjustment to vary the vertical location of its means for connection to a tractor,

a wheel axle support beam carried on the U-shaped frame near the rear thereof,

a wheel spindle affixed to each opposite end of the axle support beam outwardly of the U-shaped frame, and

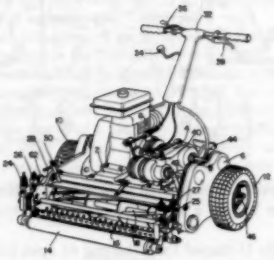
a first pair of laterally spaced mower arms attached to the frame, one on each side of the frame, with the mower arms located to position the mowers supported by the arms in transverse alignment with the wheel axle support beam.

4,481,756
COMBINE HARVESTER
Charles O. Schartz, R.R. #2, Box 76, Larned, Kans. 67550
Filed Jul. 15, 1983, Ser. No. 513,822
Int. Cl.³ A01D *41/12*
U.S. Cl. 56—10.2 **4 Claims**



1. A combine harvester of the type having a mobile chassis on which is mounted means for harvesting, threshing, separating and cleaning grain, said cleaning means including a chaffer sieve for the passage therethrough of clean grain in a first direction and a fan for operably blowing a cleaning air stream therethrough in a second direction, the improvement comprising means for sensing the presence of grain and producing a corresponding output signal, said sensing means being mounted on a carrier operably movable between a first location at the upper extremity of the vertical zone above the tail end of the chaffer sieve where grain might be carried by excessive fan power and a second location adjacent to the tail end of the chaffer sieve, and means for utilizing said output signal in order to reduce the quantity of grain between said locations.

4,481,757
GREENSMOWER WITH POWERED, VERTICALLY ADJUSTABLE LAWN CONDITIONING ROLLER
Katsumi Tsuchiya, Tokyo, Japan, assignor to Bunton Company, Louisville, Ky.
Filed Nov. 16, 1983, Ser. No. 552,535
Int. Cl.³ A01D *43/02*
U.S. Cl. 56—16.9 **14 Claims**



1. In a powered lawn mower of the type comprising a longitudinally extending engine bed support frame, a superposed engine, a transversely extending cutting reel and bed knife assembly carried by the frame, a cutting reel drive mechanism connecting the reel to the engine, a transversely extending drive roller means carried by the frame and longitudinally spaced from the cutting reel for supporting and propelling the mower, a drive roller drive mechanism connecting the drive roller means to the engine, a transversely extending front roller carried by the frame and longitudinally spaced in front of the cutting reel, a transversely extending lawn conditioning roller carried by the frame and spaced between the front roller and the cutting wheel, and a conditioning roller drive mechanism, the improvements which comprise a conditioning roller adjustment means carried by a frame and operable to adjust the vertical height of the conditioning roller with respect to the grass and the pitch of the bed knife and a conditioning roller drive mechanism further comprising an enclosed gear train means to drive selectively the conditioning roller from the cutting reel drive mechanism.

4,481,758
HAY RAKE
Byron L. Fishbaugh, St. Marys, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 11, 1983, Ser. No. 474,616
Int. Cl.³ A01D *77/08*
U.S. Cl. 56—400 **4 Claims**

1. A hay rake tooth assembly for use on an agricultural rake comprising:

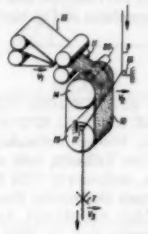
an elastomeric body having means for securing said hay rake tooth assembly to said agricultural rake;

an elongated rake tine having one end embedded in said elastomeric body, said end embedded in said elastomeric body having a bent around portion which forms an elastomeric linking member in said elastomeric body, said bent around portion extending in a substantially circular arc of at least 270°, so as to form a connecting passage of elastomeric material having no obstruction therethrough, said elastomeric body having a cross-sectional configuration as viewed in a plane parallel to the primary direction of deflection of said tine and which passes through said tine such that there is provided more elastomeric material on the side of said body which is placed in tension as opposed to the side which is placed in compression, the thickness of said body as measured from the top of said bent around portion to the outer surface of said body portion as measured at an angle of approximately 45° to the longitudinal axis of said tine is in the range of about 15% to 25% greater on the side of said body which is placed in tension in comparison to the side of said body which is placed in compression, the outer surface of said body on the sides which are placed in compression and in tension each have a radially outer convex surface portion connected to a radially inner concave surface portion, the transition point between the convex and concave surface portions being substantially below the top of said bent around portion, the cross-sectional thickness of said body from said point drawn at an angle of approximately 45° from the top of said bent around portion to the radially inner end of the body decreases in cross-sectional thickness until approximately reaching an angle of about 30° at the longitudinal axis of said tine as taken from the top of said bent around portion next, said elastomeric body being made of a material having a Shore A hardness in the range of 60 to 85 and having an elongation of at least 350%.

4,481,759
PROCESS AND DEVICE FOR MAKING SPUN YARNS COMPRISING A CORE

Jean Venot, Roanne, France, assignor to ASA S.A., Villeurbanne, France

Filed Jun. 20, 1983, Ser. No. 506,129
Claims priority, application France, Jun. 29, 1982, 82 11615
Int. Cl.³ D02G *3/36*; D01H *1/12*
U.S. Cl. 57—5 **12 Claims**



1. A process for making a spun yarn of fibres comprising a core which consists in:

positively delivering a yarn intended to form the internal core,

passing this yarn in tangential contact with a mobile guiding surface on which elementary fibres are maintained paralleled and flat, the yarn passing transversely with respect to said surface,

communicating to said core yarn a twist which tends to extend back on the mobile surface supporting the elementary fibres, said process comprising the following steps of:

passing the core yarn on the paralleled fibres obliquely with respect to the surface and in the direction of displacement of the fibres,

giving the twist communicated to the yarn by a false twist spindle, acting permanently on said yarn and which is disposed downstream of the mobile surface supporting the fibres.

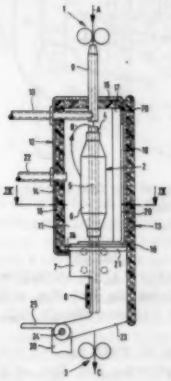
4,481,760
WRAPPED YARN SPINNING MACHINE

Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Suessen, Fed. Rep. of Germany, a part interest

Filed Jun. 15, 1982, Ser. No. 388,622
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1981, 3123887
Int. Cl.³ D02G *3/36, 3/38*
U.S. Cl. 57—18 **28 Claims**

1. A wrapped yarn spinning machine with a number of spinning units arranged in a row in side-by-side relationship on at least one machine side, each of these units comprising a delivery device for a sliver; a hollow spindle with an inlet orifice located downstream of said delivery device in a conveying direction of the sliver, a bearing housing for said spindle, a sliver feed tube between the delivery device and the spindle, said spindle carrying a binder thread in the form of a spool and being supported in said bearing housing, and a drive means for driving said spindle; and a take-up device, located downstream of said spindle in said conveying direction, for spun wrapped yarn, a closed housing means for protecting a zone of the hollow spindle carrying the binder thread spool, said closed housing means having a bottom and a side wall and being openable to uncover the hollow spindle; the zone of at least several of the units of one machine side being protected by said closed housing means which extends as integral housing in the longitudinal direction of the machine over said several units, said closed housing means including at each spinning unit a lid arranged on the front side of the machine and of a height corresponding to at least the height of the side wall of the closed housing means, the sliver feed tubes being arranged between the inlet orifices of the hollow spindles and the delivery devices, and the bearing housing of the hollow spindles being sealingly joined to the bottom of the closed housing means at least in an operative condition of the hollow spindles, said spindles having a portion projecting out of the bearing housings in a direction toward the take-up devices and being driven thereat by the drive means.

23. A wrapped yarn spinning apparatus comprising a delivery means for a sliver, a hollow spindle means following the delivery means in the conveying direction of the sliver and



having an inlet opening, said hollow spindle means carrying a binding thread in the form of a spool, bearing housing means for rotatably supporting said hollow spindle means, drive means for said hollow spindle means, take-off means following said hollow spindle means for spun wrapped yarn, and means enclosing the hollow spindle means within the area of the binding thread spool including lid means movable for rendering accessible the hollow spindle means, said means enclosing the hollow spindle means including a side wall, said lid means corresponding at least approximately to the height of the side wall, and sliver feed tube means disposed between the inlet opening of the hollow spindle means and the delivery means.

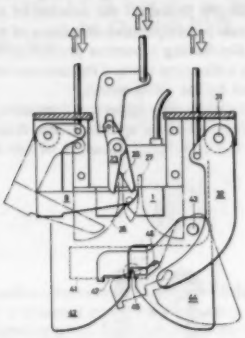
4,481,761
PNEUMATIC YARN SPLICING METHOD AND APPARATUS

Hidetoshi Kimura, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 1, 1982, Ser. No. 438,254
Claims priority, application Japan, Nov. 2, 1981, 56-175894
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—22 **8 Claims**

1. A pneumatic yarn splicing apparatus including a yarn splicing member, said yarn splicing member having opposed side faces and comprising a cylindrical splicing hole extending between the side faces, a slit extending along the full length of the splicing hole, a first nozzle being opened substantially toward the center of the splicing hole, and a second nozzle being tangentially opened to the splicing hole, wherein said first and second nozzles are communicated with a compressed air supply pipe through an air introduction hole and they are so arranged that the length of a passage extended from said air introduction hole to said second nozzle is longer than the

length of a passage extended from said air introduction hole to said first nozzle so that there is produced a time lag between



the initiation of jetting at the first nozzle and the initiation of jetting at the second nozzle.

4,481,762

CONTROL FOR YARN FALSE TWISTING APPARATUS

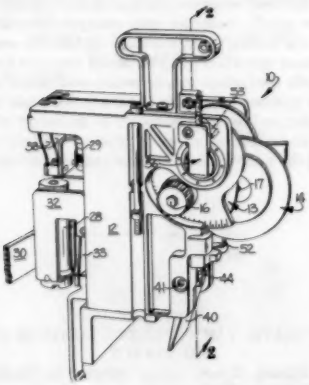
Detley Oberstrass, Tönisheide, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,796

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233624

Int. Cl.³ D02G *1/08*; D01H *13/16*

U.S. Cl. 57—80 **13 Claims**



1. A yarn false twisting apparatus comprising

a frame,

twist imparting members, each having yarn engaging friction surfaces,

means mounting said members to said frame for rotational movement wherein portions of the respective yarn engaging friction surfaces define a twisting zone therebetween,

yarn guide means for guiding a running yarn through said twisting zone and along a predetermined path on each side thereof,

drive means for operatively rotating each of said twist imparting members and such that the running yarn has twist imparted thereto at said twisting zone,

control means for setting said drive means into and out of operation,

a control arm operatively connected to said control means and being moveable between an operative position and an inoperative position, and with the operative and inoperative positions of said arm corresponding respectively to the operative and inoperative setting of said control means, and with the arm lying in said predetermined yarn path when in its inoperative position and being spaced from said path in its operative position,

whereby the arm will deflect the running yarn from said predetermined yarn path when the arm is in its inoperative position, to thereby alert the operator to the nonoperative condition of the apparatus and to block the yarn path.

4,481,763

ARRANGEMENT OF ELECTRODES FOR MONITORING THREAD BREAKAGE IN RING SPINNING MACHINES

Gerhard Fiedler, Greiz; Werner Fritzsche, Greiz-Moschwitz; Frank Herold, and Uwe Tolkmitt, both of Greiz, all of German Democratic Rep., assignors to VEB Kombinat Wolle und Seide, Meerane, German Democratic Rep.

Continuation-in-part of Ser. No. 251,811, Apr. 7, 1981, Pat. No. 4,420,697. This application Jun. 16, 1982, Ser. No. 389,144

Claims priority, application German Democratic Rep., Jun. 17, 1981, 230878

Int. Cl.³ D01H *13/16, 13/32*

U.S. Cl. 57—81 **6 Claims**

1. An electrode arrangement for monitoring thread breakage in ring spinning machines for receiving a sufficiently strong electric impulse of running thread and producing a further processable signal, comprising

(A) a thread stretching machine for feeding running thread,

(B) a guide for guiding the running thread, whereby the thread passes directly from said stretching mechanism to said guide,

(C) an adjustable electrode arranged in the vicinity of said passing thread and spaced therefrom, said electrode (C) receiving an electrostatic charge from the passing thread and in turn, transmitting a signal to an electronic circuit, and

(D) an insulated body supporting said electrode, said electrode being adjustable by displacement or turning of said insulated body.

4,481,764

TRAVELLER FOR RING SPINNING MACHINE

Arthur Würmli, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Jan. 10, 1983, Ser. No. 457,000

Claims priority, application Switzerland, Jan. 18, 1982, 263/82

Int. Cl.³ D01H *7/60*

U.S. Cl. 57—125 **6 Claims**

1. A traveller for a ring spinning machine comprising:

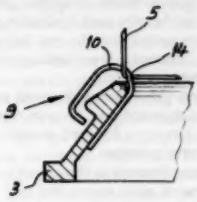
a long inner leg;

a shorter outer leg bent at an end thereof;

a yarn guide portion interconnecting the long inner leg and the short outer leg and having an apex portion;

said yarn guide portion comprising a substantially quarter

circle segment part adjoining the short outer leg and leading to the apex portion of the yarn guide portion; and



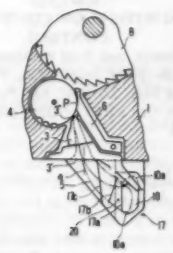
a straight section joining the apex portion and the long inner leg.

4,481,765

SLIVER GUIDE FOR USE IN OPEN-END SPINNING FRAMES

Tadanori Kurushima, Kariya; Yoshiaki Yoshida, Toyota, and Kazuo Kamiya, Nishio, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Apr. 5, 1983, Ser. No. 482,055
Claims priority, application Japan, Apr. 7, 1982, 57-49424[U]
Int. Cl.³ D01H *7/892*
U.S. Cl. 57—412 **7 Claims**



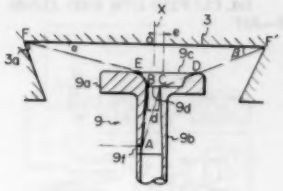
1. A sliver guide assembly for use in an open-end spinning frame, comprising a sliver collector for receiving sliver as it travels therethrough and having an inlet having a central position and an outlet, and sliver guide means positioned upstream of said collector inlet with respect to the direction of travel of said sliver and spaced laterally away from said inlet central position, said sliver guide means including restrictor means for holding and controlling the position of said sliver as it enters said sliver guide means, lateral deflector means positioned downstream of said restrictor means in the direction of travel of said sliver and being angularly displaced with respect to said restrictor means for directing the sliver towards said central position on said sliver collector inlet, and front-to-back deflector means positioned downstream of said lateral deflector means substantially adjacent to said collector inlet and being angularly displaced with respect to said lateral deflector means for directing the sliver into said inlet and to said outlet of the sliver collector.

4,481,766

YARN DRAW OFF TUBE FOR OPEN-END SPINNING UNIT

Tadanori Kurushima; Kiyoshi Takeshita, both of Kariya, and Kazuo Kamiya, Nishio, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 29, 1982, Ser. No. 454,181
Claims priority, application Japan, Dec. 29, 1981, 56-214821
Int. Cl.³ D01H *1/135, 13/04*
U.S. Cl. 57—417 **4 Claims**



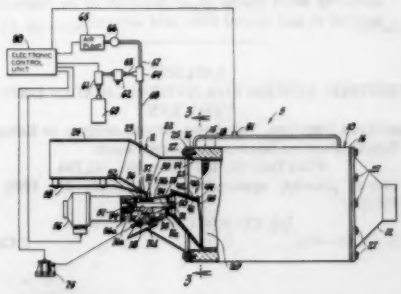
1. A yarn draw off tube for an open-end spinning unit comprising a disc portion and a tube portion extending perpendicularly from the center of said disc portion, said disc portion being provided with a yarn inlet on a top wall thereof and said tube portion being provided with a yarn outlet on a side wall thereof and, further, with a guide channel extending along an axis thereof communicating said yarn inlet with said yarn outlet, said yarn drawing off tube being characterized in that said yarn inlet is eccentric from the axis of said tube portion and has an eccentric angle substantially in a direction opposite to said yarn outlet relative to said axis.

4,481,767

DIESEL EXHAUST CLEANER AND BURNER SYSTEM WITH FLAME DISTRIBUTOR

Terrence L. Stark, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 8, 1983, Ser. No. 511,883
Int. Cl.³ F01N *3/02*
U.S. Cl. 60—303 **3 Claims**



1. An exhaust cleaner and burner system for use with a diesel engine, said system including a housing having an inlet at one end for receiving exhaust gas from an engine and an exhaust outlet at its opposite end; a filter means positioned in said housing intermediate said inlet and said exhaust outlet and having an inlet face axially spaced from said inlet; a fuel burner means operatively positioned in said housing with its flame discharge end in axial spaced apart relationship to said inlet face; said fuel burner means being adapted to be connected to an air/fuel mixture source and including an igniter means for said air/fuel mixture; and, a rotatable flame distributor means operatively associated with said fuel burner means whereby to

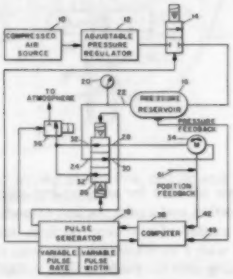
direct a flame discharged from said fuel burner means incrementally across the said inlet face of said filter means.

4,481,768

PNEUMATIC CONTROL SYSTEM FOR MACHINES

Lawrence A. Goshorn, Rancho Santa Fe, and C. Earl Bradley, Encinitas, both of Calif., assignors to International Robomation/Intelligence, Carlsbad, Calif.

Filed Aug. 14, 1981, Ser. No. 292,903
Int. Cl.³ F15B *1/06, 9/00, 13/044*
U.S. Cl. 60—327 **13 Claims**



1. A pneumatic control system for machines, which system is responsive to a source of compressed air, comprising:

a pressure storage reservoir having an outlet;

a pressure control valve means coupled between the source of air and the reservoir for controlling air flow to said reservoir;

a pneumatic actuator;

a directional control valve coupled between said reservoir outlet and said actuator and having a pair of control outlets and at least one vent outlet;

a speed control valve coupled to said vent outlet and having an outlet to atmosphere;

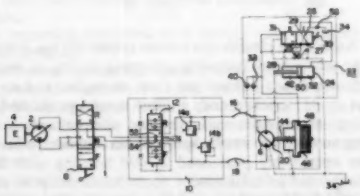
and a pulse generator means connected to said directional control valve and to said speed control valve to open and close the valves in timed short pulses and cause corresponding short pulses of air pressure to be respectively applied to and vented from said actuator.

4,481,769

CONTROL SYSTEM FOR HYDRAULICALLY DRIVEN VEHICLES

Yoshikazu Nagahara, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,734
Claims priority, application Japan, Dec. 24, 1980, 55-184666[U]
Int. Cl.³ F16H *39/04, 39/46*
U.S. Cl. 60—441 **2 Claims**



1. A control system for a hydraulically driven vehicle, comprising:

a variable displacement hydraulic pump driven by a prime mover;

a variable displacement hydraulic motor connected with said variable displacement hydraulic pump in a closed loop and driven thereby, said hydraulic motor having an ouput shaft connected thereto and being adapted to be changed over between a low displacement position and a high displacement position;

manually operated valve means disposed in the closed loop for controlling forward and reverse rotation of said hydraulic motor having a forward position, a neutral position and a reverse position;

brake valve means disposed in the closed loop between said manually operated valve means and said hydraulic motor for increasing the brake torque of said motor and for slowing said motor when said manually operated valve means is in said neutral position, said brake valve means being connected with said hydraulic motor through first and second conduits forming a part of the closed loop, said brake valve means in a neutral position thereof blocking flow from said first and second conduits to said manually operated valve means;

regulator means for controlling the displacement of said variable displacement hydraulic motor in such a manner that said hydraulic motor is changed over to the high displacement position when fluid pressure is either of said first and second conduits exceeds a predetermined level while said hydraulic motor is changed over to the low displacement position when fluid pressure in both of said first and second conduits is lower than said predetermined level, said regulator means being connected with said first and second conduits through first and second check valves, respectively; and

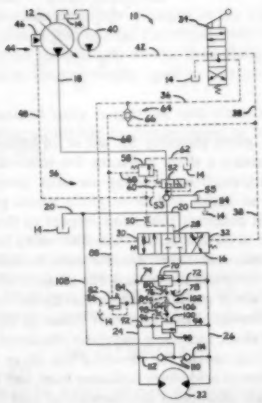
spring-applied and fluid-released brake means mounted on said output shaft, said brake means being connected with said first and second conduits through said first and second check valves, respectively.

4,481,770

FLUID SYSTEM WITH FLOW COMPENSATED TORQUE CONTROL

Kenneth R. Lohbauer, and Paul C. Moots, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 22, 1982, Ser. No. 360,854
Int. Cl.³ F16D *31/02;* **F15B** *11/02*
U.S. Cl. 60—452 **20 Claims**



1. In a fluid control system (10) having a pump (12), a tank (14) connected to the pump (12), a fluid motor (22), a pilot operated control valve (16) having a neutral and an operative position and a load sensing port (28), the pilot operated control

valve (16) being in fluid communication with the pump (12) and the fluid motor (22), first means (44) for varying the output flow and pressure from the pump (12) to the fluid motor (22) in response to a load signal received through the load sensing port (28) with the control valve (16) at the operative position, a source (40) of pressurized pilot fluid and a pilot valve (34) in fluid communication with the source (40) and adapted to controllably communicate the pressurized pilot fluid to an end (30, 32) of the control valve (16) for moving the control valve (16) to the operative position, the improvement comprising:

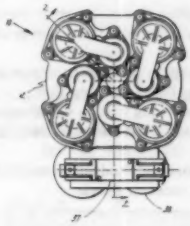
second means (56) for both varying the output flow and pressure from the pump (12) to the fluid motor (22) and controlling the torque of the fluid motor (22) in proportion to the controlled pressurized pilot fluid communicated to the end (30, 32) of the control valve (16), said second means being operatively connected to said controlled pressurized pilot fluid communicated to the end (30, 32) of the control valve (16).

4,481,771

HEAT EXCHANGER STACK APPARATUS

Roelf J. Meijer, and Benjamin Ziph, both of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Aug. 6, 1982, Ser. No. 405,749
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—517 **6 Claims**



1. In a Stirling engine which includes a heat exchanger arranged in a stacked generally aligned relation with a cooler and a regenerator so that the regenerator is located at one end of the heat exchanger, with a connecting duct at the opposite end of the heat exchanger, the improvement comprising means forming part of said heat exchanger providing for flexibility of said heat exchanger so that the internal volume of said heat exchanger can contract and expand in response to heating and cooling thereof, and a plurality of tubes in said heat exchanger communicating at their ends with and extending between said regenerator and said duct so that engine working fluid flowing through said tubes can be heated in said heat exchanger.

4,481,772

GAS TURBINE POWER PRODUCTION UNIT INCLUDING A FREE PISTON GAS GENERATOR

Henry Benaroya, 41, Blvd. du Commandant Charcot 92200, Neuilly sur Seine, France

Filed Sep. 27, 1983, Ser. No. 536,372
Claims priority, application France, Sep. 27, 1982, 82 16225
Int. Cl.³ F02B *71/04*
U.S. Cl. 60—595 **10 Claims**

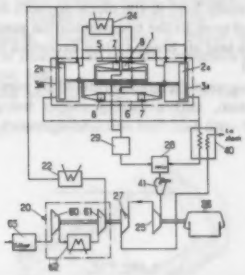
1. A power unit comprising:

a free piston gas generator having a plurality of compressor chambers, motor cylinder means, and a reciprocable assembly having drive piston means slidably received in said motor cylinder means and a plurality of compression pistons cooperating with said compression chambers, whereby reciprocation of said assembly alternately increases and decreases the volumes of said compression chambers,

a power gas turbine connected to receive a flow of exhaust gas from an exhaust of said motor cylinder means,

a rotary compressor connected to said compression chambers through first cooling means to deliver air at chambers through first cooling means to deliver air at above atmospheric pressure to said compressor chambers,

said compressor chambers being distributed into a first set and a second set with outlets of the first set of said compression chambers being connected to deliver air to said motor cylinder means through second cooling means and outlets of the second set being connected to deliver hot pressurized air to said flow of exhaust gas prior to admission to said power gas turbine, whereby said exhaust gas and hot air mix before delivery to the turbine,



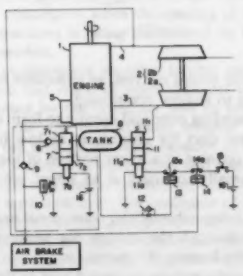
and heating means for increasing the temperature of the mixture of hot air and exhaust gas before delivery to the turbine.

4,481,773

TURBO-SUPERCHARGING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroshi Sugito, and Tamotsu Kasuya, both of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,980
Claims priority, application Japan, Apr. 7, 1982, 57-49405[U]
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—606 **5 Claims**



1. A turbo-supercharging system for an internal combustion engine of a vehicle having an air brake system, comprising:

an engine;

a turbo-supercharger including a turbine and a compressor;

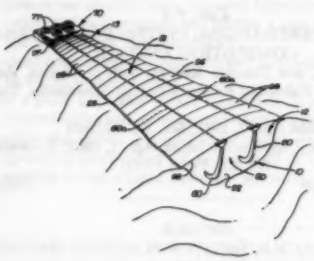
exhaust pipe means for introducing exhaust gas from said engine into said turbine to thereby rotate said turbine;

intake pipe means for introducing compressed air from said compressor into said engine;

air compressor means driven by said engine;

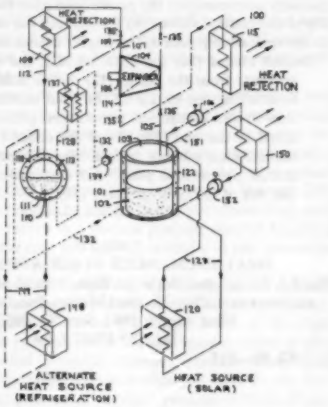
first conduit means for supplying compressed air from said air compressor means to said air brake system;
air tank means for storing compressed air therein;
second conduit means for interconnecting said first conduit means and said air tank means;
third conduit means for interconnecting said air tank means and said turbine;
first solenoid-operated valve means disposed in said second conduit means, said first solenoid-operated valve means having a block position and a communication position and being normally held in the block position and adapted to be changed over to the communication position when air pressure in said air brake system exceeds a predetermined value; and
means for detecting the predetermined air pressure in said air brake system, said detecting means being operatively connected with said first solenoid-operated valve means.

4,481,774
SOLAR CANOPY AND SOLAR AUGMENTED WIND POWER STATION
Stephen R. Snook, P.O. Box 846, Port Hueneme, Calif.
Continuation-in-part of Ser. No. 113,627, Jan. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 24,159, Mar. 26, 1979, abandoned, which is a continuation of Ser. No. 870,336, Jan. 18, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,238
Int. Cl.³ F03G 7/02
U.S. Cl. 60—641.14 **70 Claims**



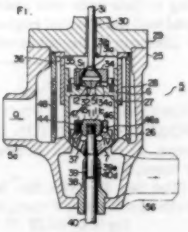
1. In combination with a canyon, an apparatus for converting solar radiation to airflow comprising
(a) a canopy extending over said canyon to form a longitudinally elongated duct for channeling airflow from a relatively larger opening at a lower portion of the canyon to a relatively smaller opening at an upper portion of the canyon,
(b) said canopy being substantially transparent to solar radiation passage through the canopy for impinging on the canyon thereby heating the canyon walls,
(c) the canyon walls serving to impart heat to the air proximate the canyon walls and located within said duct,
(d) the heated air, being of lesser density, flowing generally toward said upper opening and colder, more dense air entering the duct at the lower opening, said heated air being channeled by said duct in its flow to the smaller opening where it is emitted,
(e) said cooler air entering the duct at the lower opening then being heated by the canyon walls to flow upward to the smaller opening, generating a continuous flow within said duct.

4,481,775
STORED ENERGY POWER GENERATING SYSTEM
John Beveridge, P.O. Box 4965, Irvine, Calif. 92716
Filed Jan. 5, 1981, Ser. No. 222,803
Int. Cl.³ F01K 25/06
U.S. Cl. 60—649 **14 Claims**



1. A method of cycling thermodynamic energy comprising:
adding heat to a working fluid in a receiver means to vaporize said fluid;
passing said fluid vapors through a conversion means;
condensing vapors of said working fluid;
accumulating said working fluid in a holding tank containing an absorbent which has a strong molecular attraction for said fluid;
transferring heat from said fluid and absorbent in said tank to said fluid in said receiver means.

4,481,776
COMBINED VALVE
Tutomu Araki, and Hidesumi Kuwashima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 30, 1981, Ser. No. 325,869
Claims priority, application Japan, Dec. 2, 1980, 55-169091; Jan. 21, 1981, 56-6336
Int. Cl.³ F01K 13/02; F16K 1/00
U.S. Cl. 60—660 **5 Claims**



1. A combined steam valve in which a stop valve for blocking the flow of heated steam into a steam turbine and a control valve for controlling the flow rate of the heated steam supplied to the turbine are arranged in the same valve casing,
wherein said stop valve is arranged upstream of the control valve with respect to the flow of the heated steam, a valve body constituting said control valve is provided with a bypass valve and a steam passageway for introducing the

heated steam, which has passed through said bypass valve, into the steam turbine, and

wherein a valve body of said bypass valve is attached to a valve stem for opening and closing said bypass valve relative to a bypass steam passageway formed through said control valve, and, on the valve body of said bypass valve and the valve body of said control valve, there are provided portions, respectively, which engage with each other to open said control valve when said valve stem is displaced in the direction for opening said bypass valve beyond a fully open position thereof, the control and bypass valves being operable for enabling the flow rate of the heated steam flowing through said steam passageway into the steam turbine to be proportional to the extent to which said bypass valve is opened, up to said fully open position, and thereafter in proportion to the extent that the control valve is opened, the bypass valve providing a fine control of the steam flow rate commensurate with the rate of increase of speed of the steam turbine during start-up, and the control valve providing a greater range of control upon opening after a desired turbine speed and load is achieved.

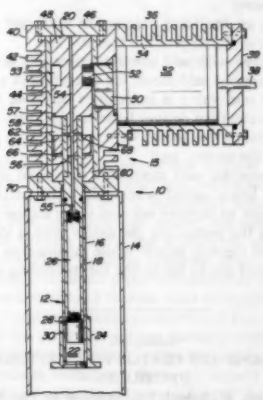
5. A combined valve as claimed in claim 1, wherein a speed relay means is interposed between a hydraulic servo means for opening and closing the control valve and a hydraulic servo means for opening and closing a steam regulating valve for controlling a heating steam introduced from a steam generator into a steam turbine of the high pressure side, said speed relay means being operative in response to a control signal to operate said two hydraulic servo means in conjunction with each other.

4,481,777

CRYOGENIC REFRIGERATOR

Domenico S. Sarcia, Carlisle, Mass., assignor to CVI Incorporated, Columbus, Ohio

Filed Jun. 17, 1983, Ser. No. 505,152
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **8 Claims**



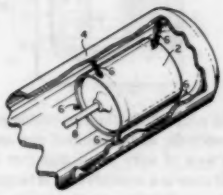
1. In a cryogenic refrigerator comprising a movable displacer means within an enclosure and cooperating with first and second chambers of variable volume, and in which a refrigerant fluid is circulated in a fluid flow-path containing a regenerator between said first chamber and said second chamber by the movement of said displacer means, means for guiding a slide connected to the displacer means, motor means associated with said slide for reciprocating said slide and said displacer means as a unit between top dead center and bottom dead center, said slide having an axial passage communicating said first chamber with said second chamber, one of said slide and displacer means having a piston for varying the volume of gas in a third chamber during said reciprocation, a valve for controlling flow of high and low pressure fluid between said third chamber and said first chamber when said displacer means is at one extremity of its movement and between said third chamber and said second chamber when the displacer means is at the other of the extremities of its movement, said valve including a movable valve member which is connected to one of said slide and displacer means.

4,481,778

THERMALLY DISCONNECTING PASSIVE PARALLEL ORBITAL SUPPORTS

Richard P. Reinker, Arvada; Myron E. Poyer, and James M. Lester, both of Boulder, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Mar. 21, 1983, Ser. No. 477,477
Int. Cl.³ F17C *1/02*
U.S. Cl. 62—45 **5 Claims**



1. A system for maintaining the spacing of a cryogen container from surrounding vacuum jacket, comprising

a first connector adapted to be fastened to the cryogenic container,

a second connector adapted to be fastened to the vacuum jacket,

a low conductance member extending between the first connector and the second connector, said low conductance member being maintained in tension between the first and second connector means and maintaining the spacing of one connector from the other in the presence of gravity and the absence of forces imposed by acceleration,

a rigid member having high-tensile strength extending between the first and second connectors within the low conductance member, said rigid member being adapted at its ends to engage the first and second connectors and to prevent them from moving apart, but having such length between its ends that its ends do not contact the first and second connectors when the spacing of the first and second connectors is being maintained by the low conductance member,

said low conductance member having such elasticity and resilience that when exposed to forces in excess of those represented by the container and its contents at normal gravity, the low conductance member will stretch and permit the ends of the rigid member to engage and hold the first and second connectors and maintain the spacing of the first and second connectors and that upon termination of such exposure, the resilience of the low conductance member will disengage the ends of the rigid member from the first and second connectors and return the first and second connectors to their normal spacing.

4,481,779

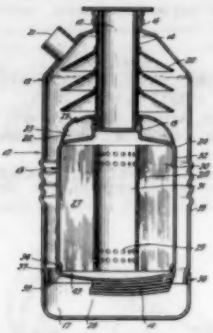
CRYOGENIC STORAGE CONTAINER

Alfred Barthel, Indianapolis, Ind., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 22, 1983, Ser. No. 506,811
Int. Cl.³ F17C *11/00*
U.S. Cl. 62—48 **15 Claims**

1. An open-to-atmosphere storage container for transporting materials at cryogenic temperatures having a micro-fibrous

structure adapted for holding a liquified gas such as liquid nitrogen in adsorption and capillary suspension within the interior of the container, said micro-fibrous structure comprising a core permeable to gaseous and/or to liquid nitrogen, with said core being centrally disposed in said container and having



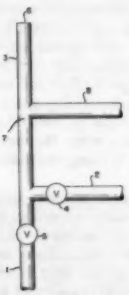
at least one void adapted for the removable placement of the transportable materials; and a liquified gas adsorption matrix composed of a web of very small diameter inorganic fibers surrounding said core in a multilayered arrangement having an outside diameter conforming to the inside diameter of the storage container.

4,481,780

PROCESS FOR THE GENERATION OF A COLD GAS

Mark A. Delano, White Plains, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 6, 1984, Ser. No. 568,909
Int. Cl.³ F17C *7/02*
U.S. Cl. 62—52 **3 Claims**



1. In a process for the generation of a cold gas comprising introducing a relatively warm gas and a liquid cryogen into the upstream end of a mixing zone; permitting the gas and liquid cryogen to mix in the mixing zone, the amount of gas being sufficient to vaporize the liquid cryogen; and withdrawing the cold gas downstream in the mixing zone,

the improvement comprising:

(a) choking the gas prior to its entry into the mixing zone;

(b) providing a linear mixing zone having, at its downstream end, a dead end; and

(c) withdrawing the cold gas as a slipstream from the mixing zone at a point intermediate between its upstream end and the dead end

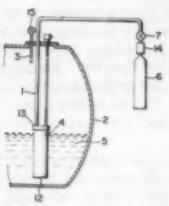
provided that the distance from the upstream end to the dead end is at least twice the distance from the upstream end to the point of withdrawal of the slipstream.

4,481,781

LIQUEFIED GAS TRANSFER APPARATUS

Masuya Tsukamoto, Hyogo, Japan, assignor to Kabushiki Kaisha Teikoku Denki Seisakusho, Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,534
Claims priority, application Japan, May 29, 1981, 56-83556
Int. Cl.³ F17C *7/02*
U.S. Cl. 62—55 **5 Claims**



1. Apparatus for transferring liquefied gas from a closed tank to a container, comprising a discharge pipe having an outlet end to which a container is connectable and having an inlet end, a glandless pump connected with the inlet end of said discharge pipe and whereby liquefied gas is drawn from said tank and is delivered to said discharge pipe, an electric motor by which the pump is driven and to which the pump also delivers withdrawn liquefied gas to be circulated through the motor and back to the tank for motor cooling and lubrication, and a valve connected in the discharge pipe between its said ends and movable between an open position permitting flow of liquefied gas to said outlet end and a closed position preventing such flow, said apparatus being characterized by:

switching means

(1) having an operative connection with said valve to be responsive to the position thereof, and

(2) connected with said electric motor and arranged

(a) to energize said motor for operation at a high speed when said valve is in its open position, so that said pump can then deliver liquefied gas from said tank to a container connected with the discharge pipe as well as to the motor, and

(b) to energize said motor for operation at a substantially lower speed when said valve is in its closed position, to thereby prevent vaporization of liquefied gas in the pump and the motor with a low expenditure of electric power while maintaining delivery of liquefied gas to the motor for its cooling and lubrication.

4,481,782

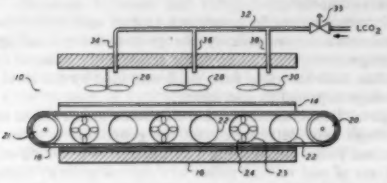
METHODS AND APPARATUS FOR REFRIGERATING PRODUCTS

Ajit K. Mukerjee, Whitehall, Pa., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Jan. 25, 1983, Ser. No. 460,963
Int. Cl.³ F25D *13/06*
U.S. Cl. 62—63 **12 Claims**

1. Tunnel refrigeration apparatus having a bottom portion disposed below an endless conveyor belt comprised of upper and lower spaced apart belt runs for passing products to be refrigerated through said tunnel; top mounted fan means for mixing a refrigerant introduced into said tunnel with the tunnel atmosphere and directing the mixture substantially downwardly toward said upper belt run, the improvement comprising fan means mounted in said tunnel substantially adjacent to said belt runs and adapted to pass at least the majority of the

flow generated by said fan means into the space between said belt runs to thereby provide refrigeration to the underside of



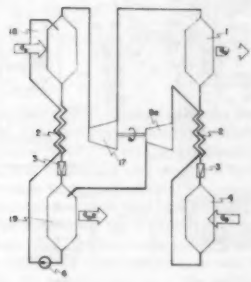
products on said upper belt runs and to substantially preclude said downflow of tunnel atmosphere from rebounding upwardly from said bottom portion toward said upper belt run.

4,481,783

HYBRID HEAT PUMP

Péter Pecz, Dunaujváros, and Géza Hivessy, Budapest, both of Hungary, assignors to Energiagazdalkodasi Intezet, Budapest, Hungary

Continuation of Ser. No. 157,422, Jun. 9, 1980, abandoned. This application Nov. 10, 1982, Ser. No. 440,529
Claims priority, application Hungary, Jun. 8, 1979, PE 1086
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—101 **5 Claims**



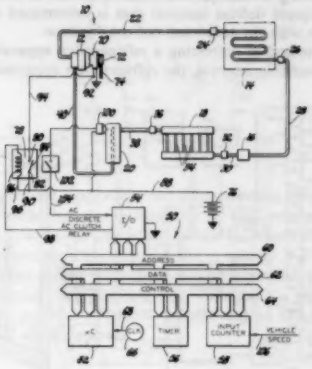
1. Hybrid compression-absorption method for operating heat pumps or refrigeration machines, with a working medium consisting of a solvent and a refrigerant soluble therein, in which in a first heat-exchange action, the refrigerant is dissolved in the solvent, heat being withdrawn, and after expansion of the working medium removed from the first heat-exchange action as liquid phase consisting of the solvent and the refrigerant dissolved therein, heat is supplied to this medium in a second heat-exchange action and thus the refrigerant dissolved in the solvent is at least partially expelled as vapour phase, and in a compression action the vapour phase of the working medium withdrawn from the second heat-exchange action is compressed, the concentration of the refrigerant in the liquid phase of the working medium being continuously varied along the path of the working medium through the second heat exchange action, characterized in that by the supply of heat in the second heat-exchange action the solvent is also partially evaporated, in that along the path of the working medium through the second heat-exchange action, preferably also through the first heat-exchange action, the concentration of the refrigerant in the vapour phase of the working medium too is varied continuously, simultaneously and in common with that of the liquid phase, and in that the vapour phase and the liquid phase of the working medium, which are withdrawn from the second heat-exchange action, are subjected simultaneously and in common to the compression action.

4,481,784

AUTOMOTIVE AIR CONDITIONING COMPRESSOR CONTROL SYSTEM

James C. Elmslie, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1983, Ser. No. 548,295
Int. Cl.³ B60H *3/04*; G05D *23/19*; F25B *27/00*
U.S. Cl. 62—133 **3 Claims**



1. In an automotive air conditioning system including an engine-driven refrigerant compressor which is normally cycled on and off at a duty cycle which increases with increasing cooling demand, a method of operation which avoids cycling of the compressor during normal idle operation of the vehicle engine when such cycling is most noticeable to the vehicle occupants, the method comprising:

sensing the onset of idle operation of the engine;

measuring the compressor duty cycle immediately prior to the onset of the engine idle operation;

comparing the measured duty cycle with a reference duty cycle corresponding to a cooling demand above which it is desirable to maintain the compressor in the on condition during normal idle operation and below which it is desirable to maintain the compressor in the off condition during normal idle operation;

maintaining the compressor in the off condition when the measured duty cycle is less than the reference duty cycle and in the on condition when the measured duty cycle is greater than the reference duty cycle; and

re-establishing normal cycling of the compressor when the elapsed time from the onset of the idle operation is such as to indicate that the idle operation of the engine is due to circumstances other than normal stop and go driving conditions.

4,481,785

ADAPTIVE DEFROST CONTROL SYSTEM FOR A REFRIGERATOR

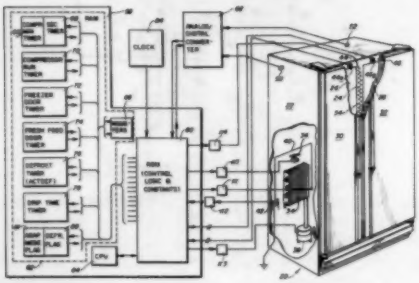
Andrew T. Tershak, Center Township, Vanderburgh County, Ind., and Michael D. Thieneman, Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 28, 1982, Ser. No. 402,469
Int. Cl.³ F25D *21/06*
U.S. Cl. 62—153 **18 Claims**

1. A method of initiating a defrost operation in a refrigerator at the end of a defrost interval, the refrigerator including a refrigerated compartment, an evaporator for cooling the compartment and defrosting means for removing frost from the evaporator during a defrost operation including means responsive to the temperature of the evaporator for terminating the defrost operation, the method comprising the steps of:

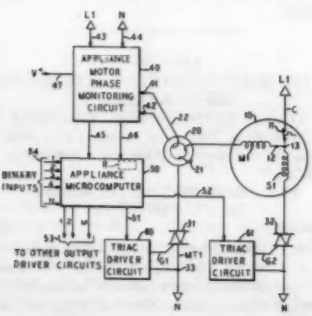
(a) developing a measure of the temperature of the evaporator during a defrost interval;
(b) initiating a defrost operation;
(c) measuring the duration of said defrost operation;
(d) correcting the measured duration of said defrost operation by an amount determined by said measured evaporator temperature to derive a corrected defrost duration; and
(e) initiating a subsequent defrost operation at the end of a subsequent defrost interval that is determined in accordance with the corrected defrost duration.

10. A method of defrosting a refrigeration apparatus at the end of a variable interval, the refrigeration apparatus having



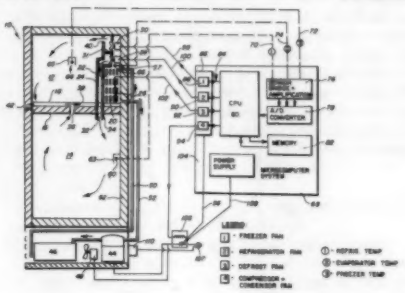
defrosting means, a cabinet defining a refrigerated space, and a door for providing access to said space, the method comprising the steps of:
(a) storing a signal having a first predetermined value;
(b) sensing when the door is open;
(c) changing the stored signal at a varying rate which decreases with time from an initial rate during a first door-open interval until a certain rate is reached;
(d) changing said stored signal at a fixed rate less than the certain rate for door-open times in excess of the first door-open interval; and
(e) initiating a defrost operation when the stored signal has been changed to a second predetermined value.

4,481,786
ELECTRONIC CONTROL FOR A DOMESTIC APPLIANCE
Larry T. Bashark, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jun. 4, 1982, Ser. No. 384,880
Int. Cl.³ H07P *1/40*
U.S. Cl. 62—160 **79 Claims**



1. An apparatus for monitoring an output torque of an AC motor supplied with a voltage at a level and an alternating current and having a run winding and for controlling the operational sequence of a device operated by said motor, said apparatus comprising:
an electronic means for generating a signal upon each occurrence of a current polarity change in said run winding;
a voltage zero detector circuit for generating a series of first pulses each having a duration determined by the level of voltage supplied to said motor;
a logic circuit connected to said electronic means and to said voltage zero detector circuit for generating a series of second pulses each having a duration from a leading edge of one of said voltage pulses to a current polarity change immediately following said leading edge;
a processing means for manipulating said first pulses and said second pulses to generate various phase angle numbers representing the output torque of said motor; and
a control means for controlling said device by initiating and concluding selected operations within said operational sequence dependent on said phase angle numbers.

4,481,787
SEQUENTIALLY CONTROLLED SINGLE EVAPORATOR REFRIGERATOR
Neil P. Lynch, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jul. 16, 1982, Ser. No. 398,955
Int. Cl.³ F25D *17/00*
U.S. Cl. 62—180 **32 Claims**



1. In a refrigeration apparatus having a refrigerated compartment, an evaporator, an evaporator fan for circulating air over said evaporator and through said compartment, a single compressor for supplying refrigerant to said evaporator and means for sensing the temperature within said compartment, a control comprising:
means for sensing the temperature within said compartment;
means for determining the rate of temperature change within said compartment; and
means for initiating operation of said compressor when the sensed temperature within said compartment is above a predetermined temperature and the rate of temperature change within said compartment reaches a predetermined value.

4,481,788
WATER HEATING SYSTEM
Hozo Yoshino, Tokyo, Japan, assignor to System Homes Company, Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan
Filed Dec. 8, 1982, Ser. No. 448,045
Claims priority, application Japan, Dec. 9, 1981, 56-197003
Int. Cl.³ F25D *17/00*
U.S. Cl. 62—181 **14 Claims**

1. A water heating system, comprising:
an outdoor heat exchanger including a heat collection chamber, a first heat transfer member receiving and transferring

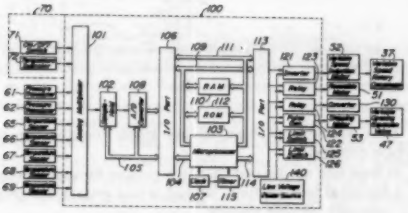
solar radiation heat, a second heat transfer member receiving and transferring the heat of ambient air, an evaporator for passing refrigerant therethrough to perform the heat exchange between said refrigerant and the heat transferred from said first and second heat transfer member, thereby evaporating said refrigerant, and said first and second heat transfer members and said evaporator being incorporated integrally in said heat collection chamber;

a compressor of varible rotational speed connected to said outdoor heat exchanger for compressing the vaporized refrigerant from said evaporator to increase the pressure and temperature of said vaporized refrigerant;

a water storage tank for storing water;

a heat exchanger disposed on the bottom side in said water storage tank for passing the refrigerant vapor from said compressor and for performing the heat exchange between the water contained in said water storage tank and said refrigerant vapor to condense said refrigerant vapor;

a variable opening expansion valve for adiabatically expanding the condensed refrigerant, thereby decreasing the pressure and temperature of said refrigerant and for supplying the refrigerant thus adiabatically expanded to said outdoor heat exchanger;



first and second pressure measuring means for measuring the saturation vapor pressure p_1 and the saturation condensation pressure p_2 of the refrigerant passing through said outdoor heat exchanger and said heat exchanger in said water storage tank, respectively;

first, second, third, fourth and fifth temperature measuring means for measuring the suction side temperature t_1 of said compressor, the inlet side temperature t_2 of said expansion valve, the temperature t_3 in said heat collection chamber, the temperature t_4 of the ambient air and the temperature t_5 of the water in said water storage tank, respectively; and

control means for controlling the rotational speed of said compressor and the opening of said expansion valve so as to maximize or substantially maximize the coefficients of performance of the refrigeration cycle including said outdoor heat exchanger, said compressor, said heat exchanger in said water storage tank and said expansion valve, in response to the pressure and the temperature measured by said first and second pressure measuring means and said first, second, third, fourth and fifth temperature measuring means.

4,481,789

AIR CONDITIONER FOR VEHICLES

Ryosaku Akimoto, and Nobuaki Ito, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Churyo Engineering Co., Ltd., Nagoya, both of, Japan

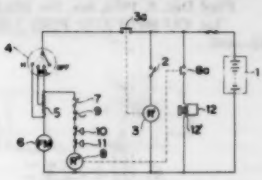
Filed Mar. 15, 1982, Ser. No. 358,297

Claims priority, application Japan, Mar. 25, 1981, 56-43704

Int. Cl.³ F25B *41/00*; G05D *23/00*

U.S. Cl. 62—209 **6 Claims**

1. An air conditioner for vehicles having means for detecting the temperature of an evaporator and adapted to effect ON-OFF control of a compressor to maintain the evaporator temperature at the same level as a pre-set temperature, characterized by comprising: means for detecting the air temperature of the air flowing into said evaporator; and means for varying said pre-set temperature in accordance with said air temperature such that said pre-set temperature is lowered as said air temperature becomes higher and is made higher as said air temperature becomes lower, said means for varying the pre-set temperature including: an input circuit having two temperature detection elements for detecting the temperature of air



flowing into said evaporator and a temperature detection element for detecting the temperature of said evaporator, and adapted to produce a reference voltage V_A which increases as the air temperature is increased and a voltage V_B which decreases as the evaporator temperature is increased; and a comparator circuit for receiving said voltages V_A and V_B and adapted to produce an output for effecting an ON-OFF control of said air compressor.

4,481,790

COOLING SYSTEM

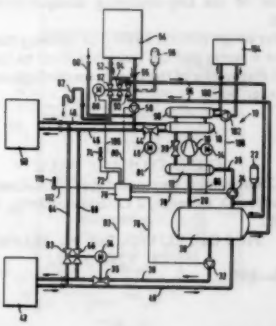
Dieter Mattes, Freiburg, Fed. Rep. of Germany, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed May 10, 1983, Ser. No. 493,223

Claims priority, application Switzerland, May 19, 1982, 823125

Int. Cl.³ F25B *27/02*

U.S. Cl. 62—238.6 **11 Claims**



1. A cooling system for at least two load units, said system comprising

a refrigeration machine having a first condenser for normal operation, a second condenser for heat pump operation an evaporator and a compressor for circulating a refrigerant through said condensors and said evaporator;

a low-temperature cooling circuit disposed in heat exchange relation with said evaporator for circulating a flow of water at a first temperature to one of the load units and having a cooling water accumulator therein; and

a cooling tower circuit for circulating a flow of water at a higher temperature than said first temperature to at least one of the load units whereby below a given ambient temperature said cooling tower circuit circulates water to the other of the load units and above said ambient temper-

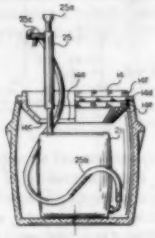
ature said cooling tower circuit circulates water to both load units.

4,481,791

INSULATED BEER KEG COOLER

Gary L. German, Farmington, Minn., assignor to Royal Keg Cooler Corporation, Elko, Minn.

Filed Dec. 5, 1983, Ser. No. 558,049
Int. Cl.³ B67D 5/62; F25D 3/08
U.S. Cl. 62—400 3 Claims



1. A cooler particularly constructed and designed for use with beer kegs,

the cooler comprising rigid bottom and side wall portions all made from insulating material and defining an open-topped compartment therein of a size to leave at least a 2-inch space surrounding the side walls of a beer keg placed therein to permit a coolant to be confined around the keg within the cooler compartment,

a removable cover having a flange therearound to be supported on the top of the cooler,

a concavo-convex center cover portion disposed within said flange and extending upwardly when said cover is in one position, but extending downwardly into the compartment when said cover is inverted to substantially reduce the size of the keg-confining compartment within the cooler,

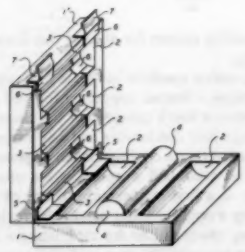
said center cover portion having an opening therethrough to receive a pump and tap assembly fixed to the beer keg to permit dispensing of the beer from the keg confined within the cooler body.

4,481,792

COLD STORAGE PACK

Theodore C. Groeger, 8 Davenport Ave., Roseland, N.J. 07068, and Theodore O. Groeger, 2 Collamore Circle, West Orange, N.J. 07052

Filed Oct. 21, 1983, Ser. No. 543,050
Int. Cl.³ F25D 3/08
U.S. Cl. 62—457 11 Claims



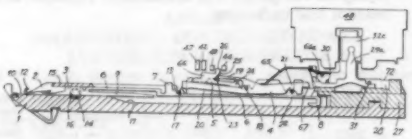
1. A cold storage container comprising: (a) a pair of symmetrical, heat-insulating blocks with a plurality of approximately semicylindrical indentations therein, spaced at a distance from each other and the boundaries of said blocks; (b) at least one heat-conducting foil continuously lining portions of all of said indentations in either block; (c) at least one heat-absorbing cylinder closely fitting into any of said indentations; and (d) conventional fastening means for connecting both of said blocks so that approximately cylindrical chambers are maintained therein.

4,481,793

KNITTING MACHINE

Claude Cuche, Corcelles, and Fritz Kohler, Couvet, both of Switzerland, assignors to Edouard Dubied & Cie. (Societe Anonyme), Switzerland

Filed Sep. 2, 1982, Ser. No. 414,516
Claims priority, application Switzerland, Jul. 19, 1982, 4389/82; Sep. 8, 1981, 5774/81
Int. Cl.³ D04B 7/00, 15/66
U.S. Cl. 66—75.2 17 Claims



1. A knitting machine having stitch transfer capability, which comprises:

at least one needle bed having a groove formed therein;

a needle at least partially housed in said groove and reciprocatingly slidable therein;

needle cam means;

needle cam follower means mounted on said needle and selectively engagable with said needle cam means whereby relative movement between said needle cam means and said needle cam follower means, when the latter is engaged with the former, causes said needle to move relative to said needle bed;

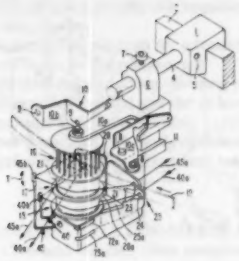
control means for selecting a needle stitch and including a selection station and at least one selector member slidably mounted on said needle bed, said selector member being responsive to said selection station and positioned thereby in one of at least two distinct positions in respect to said needle bed; and

needle cam disengaging means responsive to said stitch selecting control means for controllably disengaging said needle cam follower means and including a lever pivotally mounted on said needle bed and having a first arm which cooperates with said selector member and a second arm opposite the first which communicates with said needle cam follower means via said needle and acts operatively thereon to disengage said needle cam follower means from said needle cam means, said lever being responsive to said selector member so as to occupy distinct positions about its pivotal axis which correspond to distinct positions of said selector member; a tuck selector slidably mounted on said lever; tuck selector first cam means; tuck selector cam follower means mounted on said tuck selector which engages said tuck selector first cam means when said lever is in one of said distinct positions whereby relative movement between said tuck selector first cam means and said tuck selector cam follower means, when the latter is engaged with the former, causes said tuck selector to move from a first position to a second position in respect to said lever; and tuck selector second cam means positioned to engage said tuck selector when said tuck selector is in said second position which, when engaged with said tuck selector, causes the second arm of said lever via said tuck selector to disengage said needle cam follower.

4,481,794
YARN FEEDING APPARATUS FOR CIRCULAR KNITTING MACHINES

Masatoshi Sawazaki, Hyogo, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Japan

Filed Oct. 14, 1982, Ser. No. 434,364
Claims priority, application Japan, Feb. 5, 1982, 57-017233
Int. Cl.³ D04B *15/48*
U.S. Cl. 66—132 T **5 Claims**



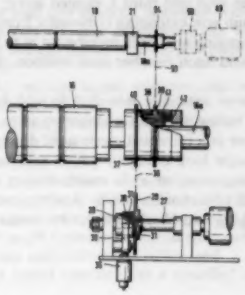
1. Self-actuating yarn feeding apparatus for feeding yarn to a circular knitting machine when the machine makes a demand for the yarn and to cease feeding the yarn when the machine ceases to make such a demand, the apparatus comprising a yarn feed wheel rotatable about a vertical axis, rotation means to rotate the yarn feed wheel, a pair of spaced yarn guide eyelets to direct the yarn circumferentially about the rotating wheel, the yarn being in contact with the peripheral surface of the wheel at all times, control means acting upon the yarn to vary the degree of circumferential contact between the yarn and the peripheral surface of the rotating wheel, the arrangement providing that when the machine ceases to make a demand for the yarn the degree of contact between the yarn and the rotary wheel is insufficient to cause the wheel to feed the yarn to the machine and that when the machine makes a demand for the yarn the degree of contact between the yarn and the rotary wheel is sufficient to cause the wheel to feed the yarn to the machine, the control means providing an additional yarn eyelet through which the yarn passes as it moves between and through the pair of eyelets, the additional yarn eyelet being movable back and forth in a circular path about a vertical axis which is parallel to the axis of the yarn feed wheel and which is located within a cylinder defined by the peripheral surface of the wheel with the additional eyelet itself being located without the so defined cylinder, the additional eyelet being mounted upon a substantially rigid guide arm extending between itself and its axis of rotation, and being so movable in response to demand and lack of demand for the yarn by the machine thereby to automatically provide the appropriate degrees of contact between the yarn and the rotating wheel to feed and not to feed the yarn to the machine.

4,481,795
MECHANISM FOR FLAT KNITTING MACHINES AND AN OPERATING METHOD FOR THE TAKING DOWN OF SHAPED KNITTED PRODUCTS

Ernst Goller, Reutlingen; Günther Kazmaier, St. Johann-Ohnastetten, and Hans D. Trissler, Reutlingen, all of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Reutlingen, Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 457,953
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209480
Int. Cl.³ D04B *15/88*
U.S. Cl. 66—150 **7 Claims**

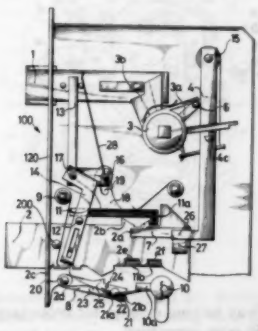
1. A mechanism for flat knitting machines for taking down shaped knitted products having a driven main take-down roller and an auxiliary take-down roller which precedes the main roller in the take-down direction and is disposed adjacent the stitch formation area and cooperates with a press roller, this auxiliary take-down roller being coupled drivingly with the main take-down roller, characterised by the fact that the auxiliary take-down roller (**18**) is provided, with the object of acquiring a superimposed rotary motion, at least in the direction of take-down with an auxiliary driving device (**29–35**) which can be operated intermittently through a control arrangement and brought into action through a clutch (**38**) capable of assuming a free wheel status.



4,481,796
MORTISE LOCK PROVIDED WITH BOLT AND LATCH

Kurt Hamme, Berlin, Fed. Rep. of Germany, assignor to Zeiss Ikon AG, Berlin, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,988
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027462
Int. Cl.³ E05D *59/04*
U.S. Cl. 70—107 **9 Claims**



1. A mortise lock comprising:
a lock case;
a latch member mounted within said lock case;
a bolt member positioned below said latch member within said lock case;
a pair of L-shaped lever members pivotally connected to each other and slidingly and swingingly to said latch member and said bolt member, respectively;
a spring member positioned within said lock case and biasing said bolt member toward the engaged or forward position;
a bolt control lever slidingly and swingingly connected to one of said L-shaped lever members and capable of controlling the position or mode of said bolt member;
a third L-shaped lever mounted at one end to said lock case;

a fourth L-shaped lever pivotally affixed by some means to said bolt member;

means for pivotally connecting said third and fourth L-shaped lever arms to one another;

a locking hub rotatably mounted within said lock case;

at least one hub arm extending outwardly from said locking hub so as to abut said third L-shaped lever;

at least one hub arm extending outwardly from said locking hub and engaging said latch member so as to be capable of retracting said latch member upon rotation of said locking hub;

a blocking lever rotatably mounted to said lock case and positioned below said bolt member so as to maintain the bolt member in a retracted mode until disengaged; and

a rotary cylinder lock mounted within said lock having at least one stop nose so as to enable a user to retract or engage said bolt member while simultaneously engaging or disengaging said blocking lever by means of a key.

4,481,797

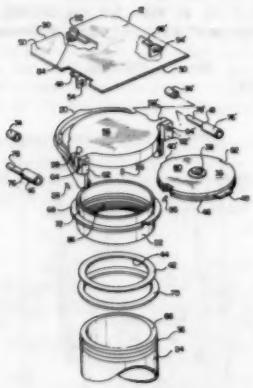
TANK FILL CAP LOCKING SYSTEM

August Milo, 478 Schiller St., Elizabeth, N.J. 07206

Filed Feb. 2, 1982, Ser. No. 344,988

Int. Cl.³ B65D *55/14, 53/00*

U.S. Cl. 70—167 **14 Claims**



1. A tank fillcap locking systems for protecting the filling end of a tank fill pipe comprising

an adaptor engaged upon the filling end of the fill pipe, the adaptor being provided with an internal groove;

a second locking plate means releasably connected to the adaptor at the said groove to obstruct the fill pipe;

a fill cap removably attached to the adaptor over the second locking plate means;

a first locking plate means overfitting the fill cap and at least partially covering the fill cap,

the fill cap comprising a body and a handle movable with respect thereto between open and closed positions, the first locking plate means comprising a handle bracket adapted to engage a portion of the handle; and

lock means between the fill cap and the first locking plate means to releasably secure the first locking plate means to the fill cap.

4,481,798

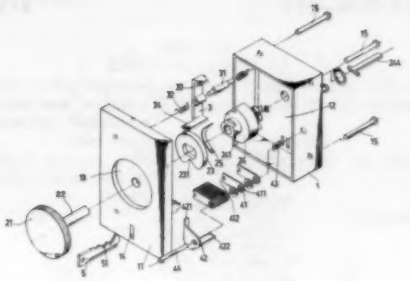
DOOR LOCK

Takhi Inada, No. 17-7, Tai Chung Kan Rd., Sec. 2, Taichung, Taiwan

Filed Feb. 23, 1982, Ser. No. 351,352

Int. Cl.³ E05B *21/00, 25/00*

U.S. Cl. 70—349 **6 Claims**



1. A door lock, comprising:

a casing;

means, rotatably mounted in said casing, for actuating a lock bolt between a locking position and a release position,

said actuating means including a cam member, a shaft having one end inserted into said cam member and another end extending outwardly of said casing, and a link member connected to said cam member for actuating said lock bolt; and

means for locking said actuating means against rotation when the lock bolt is in its locking position, said locking means releasing said actuating means from said locking position when a key is inserted and said actuating means is rotated by external action that does not route through the key.

4,481,799

ARRANGEMENT FOR REGULATING A ROLLING MILL FOR METAL ROLLING

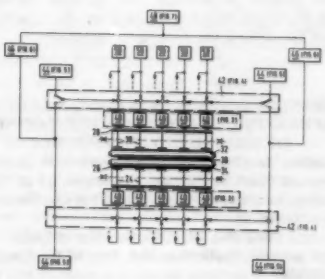
Adolf Glattfelder, Zürich; Heinz Güttinger, Schaffhausen, and Josef Mercx, Baden, all of Switzerland, assignors to Escher Wyss Aktiengesellschaft, Zürich, Switzerland

Filed Feb. 22, 1982, Ser. No. 350,631

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109536

Int. Cl.³ B21B *37/12*

U.S. Cl. 72—8 **18 Claims**



1. An arrangement for regulating a four-high rolling mill for rolling metal, said rolling mill having work rolls which are controlled by guided roll shells of a lower controlled deflection roll and an upper controlled deflection roll, the roll shells

of which bear against a related roll support by means of hydrostatic pressure elements exerting a pressure therebetween, said regulation arrangement comprising:

first regulation circuits for regulating said pressure exerted by said hydrostatic pressure elements;

at least one second regulation circuit for regulating the position of said roll shells;

said at least one second regulation circuit being provided with means for overriding said first regulation circuits and for impressing adjustment output magnitudes of the second regulation circuit upon the first regulation circuits as adjustment magnitudes;

at least one third regulation circuit for selectively regulating either the roll force or the roll nip; and

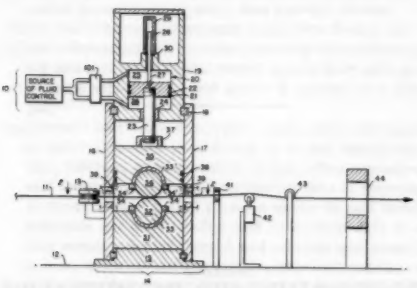
said at least one third regulation circuit being provided with means for overriding the first and the at least one second regulation circuits and for impressing adjustment output magnitudes of the at least one third regulation circuit upon the first regulation circuit as adjustment magnitudes.

4,481,800

COLD ROLLING MILL FOR METAL STRIP

Robert C. Ruhl, Cleveland Heights, Ohio, assignor to Kennecott Corporation, Cleveland, Ohio

Filed Oct. 22, 1982, Ser. No. 435,981
Int. Cl.³ B21B *37/00*
U.S. Cl. 72—10 **20 Claims**



1. A rolling mill system for rolling metal into strip form comprising:

(a) a roll mill stand comprising:

(i) a frame;

(ii) a pair of metal working rolls mounted in said frame to define a gap therebetween suitable for metal rolling, one of said metal working rolls being movable with respect to said frame;

(iii) drive means for rotating said metal working rolls; and

(iv) at least two gap adjusting devices, mounted in said frame on opposite sides of the centerline of the metal strip, for applying forces independently to opposite ends of said movable metal working roll; and

(b) means for measuring the camber of the rolled metal strip, said camber measuring means being external to said roll mill stand and comprising a pair of load cells, each cell supporting one end of a cylindrical roller over which said strip travels; and

(c) control means for generating a control signal representative of the measured camber and for operating at least one of said gap adjusting devices to change the tilt of said movable working roll, with respect to the other roll, responsive to said control signal, said means for generating a control signal comprising:

(i) means for generating a voltage signal representative of said difference in tension across the width of the strip and camber;

(ii) means for converting said voltage signal to a value for actual camber in accordance with the following equation:

$$c = \frac{7776\,Sb(e - e_0)}{Etw^3(\tan x + \tan y)}$$

where

S is the load cell spacing, center to center;

b is the vertical force (difference) per volt;

e is the voltage signal with strip in place on cylindrical roller;

e_o is the voltage signal without strip in place on the cylindrical roller;

E is the Young's modulus of strip;

t is the strip thickness;

w is the strip width;

x is the angle between the metal strip and the horizontal at the approach to said cylindrical roller;

c is the camber chord distances, inches in 6 feet;

y is the angle between the metal strip and the horizontal leaving said cylindrical roller; and

c is the actual camber over a specified chord distance; and

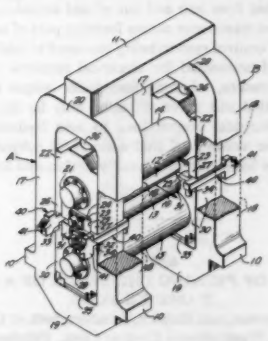
(iii) means for converting the calculated actual camber value to said control signal.

4,481,801

LOAD-TRANSFER MECHANISM

William I. deVersterre, Warren, and Donald A. Worden, Pompton Plains, both of N.J., assignors to Marotta Scientific Controls, Inc., Boonton, N.J.

Continuation of Ser. No. 347,687, Feb. 11, 1982, abandoned. This application Dec. 19, 1983, Ser. No. 562,865
Int. Cl.³ B21B *37/08, 31/32*
U.S. Cl. 72—21 **16 Claims**



1. A load-transfer block adapted for bodily insertion between and direct delivery of separating force to opposed surfaces of opposed back-up roll chocks of a rolling mill, said block comprising first and second rigid generally rectangular prismatic bodies and means including at least one pivot interconnecting said bodies for limited articulation along an array alignment, each of said bodies having a first load-sustaining surface on one side and a cylinder bore open to the opposite side, said bore having a diameter greater than its axial depth, a piston having sealed fit to each bore and having a second load-sustaining surface exposed outside its associated bore and facing in the direction away from said first load-sustaining surface, conduit means including a flexible element interconnecting cylinder bores of said bodies, and hydraulic supply means carried by one of said bodies generally on said array alignment and on the side remote from the other of said bodies, said hydraulic supply means including an electrically operable servo valve with a passage connection to the adjacent cylinder

of said one block for control of pressurized fluid-flow into and out of said cylinder bores via said one body, and pressure-transducer means connected for electrical response to pressure in said passage connection, whereby transducer output may be remotely evaluated and valve actuation may be remotely controlled via electrical connections to said hydraulic supply means and the volume of hydraulic fluid subject to valve control may be substantially localized within said load-transfer block.

8. A rolling mill comprising two horizontally spaced parallel upstanding end housings, two vertically spaced working rolls extending horizontally between said housings and establishing a pass from an entry side to an exit side for through-travel of material to be rolled, a back-up roll vertically behind each of said working rolls, a back-up roll chock at each end of each of the back-up rolls and providing rotary bearing support for the respective ends of the back-up rolls, chock-support means including a vertical chock guide in each of said housings for accommodating at each end housing vertical displacement of at least one of said back-up rolls, loading means at each end housing for urging the associated chocks toward each other to force the back-up rolls against the working rolls to load the working rolls, and a load-transfer block between associated chocks on both the entry side and the exit side of said pass, each said load-transfer block comprising a unitary assembly of plural vertical-action hydraulic piston-cylinder actuators in elongate array, the length of the array providing plural horizontally spaced regions of load-opposing vertical spreading-force application to the associated back-up roll chocks, a separate hydraulic fluid supply and control system forming part of and connected for exclusive service of the piston-cylinder actuators of each load-transfer block assembly, said hydraulic supply and control system including an electrically operable servo valve mounted to and at one end of said array with hydraulic-passage connection to said actuators for control of pressurized fluid flow into and out of said actuators, and pressure-responsive transducer means forming part of said hydraulic supply and control system being mounted to said one end of said array and connected for electrical response to passage-connection pressure, whereby transducer output may be remotely evaluated and valve actuation may be remotely controlled via electrical connections to said hydraulic supply means and the volume of hydraulic fluid subject to valve control may be localized substantially within said load-transfer block.

4,481,802

METHOD OF PEENING THE INSIDE OF A SMALL DIAMETER TUBE

Douglas G. Harman, and Ralph E. Lambert, both of Tampa, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1981, Ser. No. 297,901
Int. Cl.³ B21J 5/00
U.S. Cl. 72—53 **7 Claims**

1. A method of peening the inside of a portion of a tube comprising the steps of:

inserting into the tube a shaft having a peening strip affixed to one end thereto, the peening strip having shot so disposed thereon that the distance between the shot and the axis of the shaft by way of the peening strip is greater than the inner diameter of the tube so that peening occurs in the area diametrically opposite the location of the shaft as well as the area adjacent thereto;

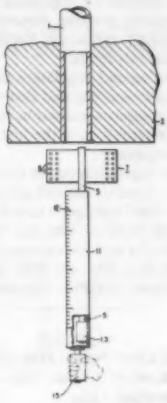
rotating said shaft at high speed;

orbiting said shaft at a relatively slow speed as it rotates;

maintaining a predetermined minimum clearance between the orbiting shaft and the tube;

manually locating the peening strip a predetermined distance in the tube;

manually reciprocating the shaft over a predetermined distance; and



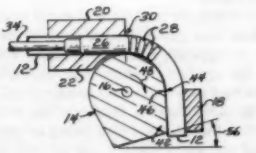
continuing the above-mentioned steps for a predetermined period to relieve residual stresses in a portion of the tube.

4,481,803

METHOD FOR ELIMINATING DISTORTION AT THE END OF A TUBE BEND

John J. Dieser, Aurora, Ill., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Mar. 18, 1983, Ser. No. 476,768
Int. Cl.³ B21D 9/05
U.S. Cl. 72—150 **6 Claims**



1. A method for bending a tube at a desired angle, comprising the steps of:

locating the tube over a mandrel;

clamping said tube between a clamp die and a bend die;

rotating said clamp and bend dies through said desired angle to form a bend in the tube; and

extracting said mandrel from said tube bend, wherein said extracting step is initiated before said die rotation is completed and continues during a remaining portion of said die rotation which completes bending of the tube.

4,481,804

METHOD AND APPARATUS FOR CALIBRATION OF SENSORS

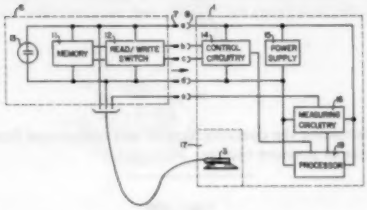
Patrick Eberhard, Allschwil; Wolfgang Mindt, Münchenstein; Jean-Pierre Palma, Pratteln; Robert Schäfer, Basel, and Robert Schärf, Ramlinsburg, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 30, 1982, Ser. No. 413,045

Claims priority, application Switzerland, Sep. 4, 1981, 5721/81

Int. Cl.³ G01L *27/00*; G01N *27/26*

U.S. Cl. 73—1 G **9 Claims**



3. A system for determining the partial pressure of a sample gas, said system comprising:

(1) an independent and separate sensor unit which includes a partial pressure sensor and a data memory device,

(2) an independent and separate calibration device; and

(3) an independent and separate measuring device for receiving and processing measurement signals from said partial pressure sensor when said sensor is exposed to a sample gas;

said sensor unit being removably connectable alternatively to either said calibration device or to said measuring device, wherein, said calibration device, when connected to said sensor unit, generates calibration data in response to exposure of said partial pressure sensor to said standard reference gas and transfers said calibration data to said data memory device thereof, and wherein said measuring device, when connected to said sensor unit, receives said calibration data from said data memory device and utilizes said calibration data in the processing of measurement signals from said partial pressure sensor.

4,481,805

METER PROVER APPARATUS AND METHOD

Eugene L. Dobesh, Houston, Tex., assignor to F. H. Maloney Company, Houston, Tex.

Filed Jun. 3, 1981, Ser. No. 289,241

Int. Cl.³ G01F *25/00*

U.S. Cl. 73—3 **57 Claims**

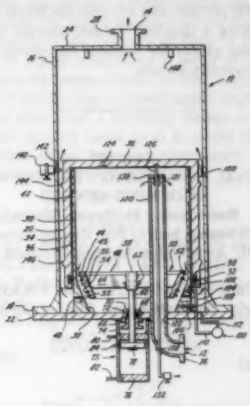
1. A meter prover for calibrating a flowmeter, comprising:

a conduit in flow communication with the flowmeter;

expansible chamber means for measuring fluid volume, said chamber means including a container means and a barrier means, said container means being disposed within said conduit and said barrier means being adapted to move with respect to said container means in synchrony with fluid flow;

first indicator means for indicating the beginning of the measurement of said volume;

second indicator means for indicating the end of the measurement of said volume; and



a single detector activated by said first indicator means and deactivated by said second indicator means for defining a precise volume of fluid in said chamber means.

4,481,806

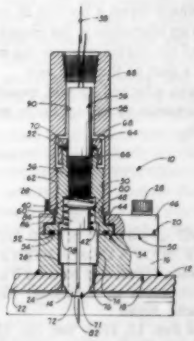
DETECTOR FOR A METER PROVER

Charles A. Schad, Tulsa, Okla., assignor to Metric Corporation, Tulsa, Okla.

Filed Nov. 8, 1982, Ser. No. 439,939

Int. Cl.³ G01F *25/00*; H01H *3/16*

U.S. Cl. 73—3 **8 Claims**



1. A detector for a prover, comprising:

a barrel constructed of a non-ferromagnetic material and having a circular bore formed longitudinally therethrough;

a magnet proximity switch mounted in portions of the barrel bore near one end of the barrel, the axis of said bore defining an approach axis for the proximity switch for actuating the proximity switch in response to movement of a nonmagnetized ferromagnetic body along the approach axis toward the proximity switch;

a piston disposed partially in the barrel bore near the other end thereof for movement along the approach axis toward the proximity switch, the piston having a cylindrically symmetric portion, constructed of a ferromagnetic material and centered on the proximity switch approach axis, at the end thereof nearest the proximity switch; and

means for urging the piston away from the proximity switch;

wherein the piston is characterized as having an enlarged diameter portion adjacent said cylindrically symmetric portion to form a shoulder extending about the base of said cylindrically symmetric portion; and wherein the barrel bore is characterized as having a shoulder formed therein to engage said shoulder on the piston for limiting movement of the piston toward the proximity switch.

4,481,807

INTERNAL COMBUSTION ENGINE WITH A KNOCKING SENSOR

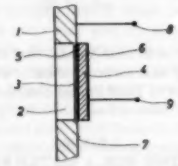
Richard Van Basshuysen, Heilbronn-Biberach, and Dieter Stock, Bad Wimpfen, both of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed May 4, 1982, Ser. No. 374,633

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120037

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **5 Claims**



1. An internal combustion engine with a knock sensor integral to an engine housing thereof comprising:

a plurality of walls;

a membrane which forms a portion of one of the walls and which picks up vibrations in the engine housing caused by a knocking of the engine wherein the membrane is formed by thinning a part of the wall; and

a sensor element attached to said membrane which transforms the vibration picked up in the membrane into electrical signals.

4,481,808

METHOD AND APPARATUS FOR DETECTING THE CONCENTRATION OF A COMPONENT IN A SOLUTION

Jiro Sakata; Masana Hirai, and Minoru Yamamoto, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Feb. 12, 1981, Ser. No. 234,069

Claims priority, application Japan, Feb. 20, 1980, 55-20936

Int. Cl.³ G01N *13/00*

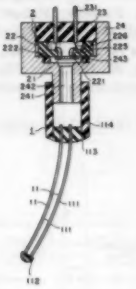
U.S. Cl. 73—61.1 R **41 Claims**

1. A method for detecting the concentration of a component in a solution, comprising the steps of

placing one of a first liquid and a second liquid containing a component soluble in said first liquid in a closed container having a partition formed at least partially by porous material having small through pores and having a critical surface tension which is lower than a surface tension of said first liquid when said component in said second liquid is dissolved therein,

positioning the other of said first and second liquids outwardly of, and in contact with said partition formed by said porous material,

detecting as a rate of pressure change in said closed container a rate of the mass transfer occurring between said first and second liquids through said partition of said porous material, and



determining the concentration of said component from said rate of pressure change.

4,481,809

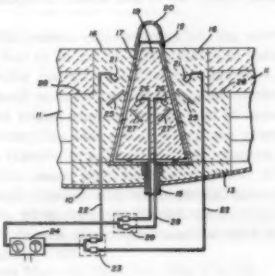
METHOD AND APPARATUS FOR MONITORING EROSION IN GAS STIRRING DEVICES IN MOLTEN METAL LADLES

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Aug. 29, 1983, Ser. No. 527,362

Int. Cl.³ G01N *17/00*

U.S. Cl. 73—86 **7 Claims**



1. A system for monitoring wear of a stirring block and a plug disposed in a passageway therein in a molten metal ladle, said system comprising a first metal member and a first Hall effect transducer for producing a first output representing the area in at least one location in said stirring block; a second metal member and a second Hall effect transducer for producing an output representing the area in at least one location in said plug; circuitry for monitoring said first and second Hall effect transducer outputs and producing signals when the area of either of said metal members changes a predetermined value.

4,481,810

ADJUSTABLE WIND DIRECTION DEVICES

William F. O'Brien, Long Valley, N.J., assignor to Ketchum & McDougall, Inc., Roseland, N.J.

Filed Jun. 1, 1982, Ser. No. 383,894

Int. Cl.³ G01C *21/00, 17/08*

U.S. Cl. 73—178 R **2 Claims**

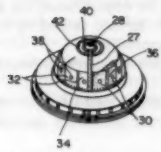
1. An adjustable wind tracking device for sailing vessels comprising:

a base;

a pivot point on an axis of said base, said pivot point being near a bottom plane of said base;

a reference card, said reference card including a spherical sector, at least one concentric circle on a top surface of said spherical sector, a cylindrical skirt extending downwardly from said spherical sector coaxial therewith, an axially extending pivot pin extending downwardly from said spherical sector and pivotable about said pivot point on said base with only an end portion of said pivot pin extending below said skirt;

said cylindrical skirt of said card including different color panels having circumferential widths of 45° each with each alternate panel having the same color, each said color panel including a vertically extending centerline of a color different from that of said color panel to divide each



said different color panel into equal segments of 22½°, each of said color segments of said skirt includes a different colored dot on its center with each color dot separated by 22½°;

an open-ended dome enclosing said reference card, said dome including an indicia on its axis coaxial with said reference card, a heavy vertically extending line affixed onto said dome and extending toward said indicia thereon;

a damping fluid within said dome with said open end of said dome sealed to said base to prevent leakage of said fluid, said base including an outwardly extending skirt surrounding said open end of said dome; and

a base plate whereby said base of said wind tracking device fits into said base plate with a snap fit for relative rotation thereon.

4,481,811

MEASUREMENT OF FLUID OSCILLATION AMPLITUDE

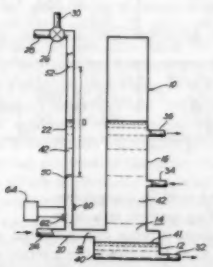
William R. Loosemore, Abingdon; Roger D. Watkins, Wantage, and Colin L. Desborough, Faringdon, all of England, assignors to British Nuclear Fuels Limited, Warrington, England

Filed Mar. 21, 1983, Ser. No. 477,308

Claims priority, application United Kingdom, Apr. 5, 1982, 8210053

Int. Cl.³ G01F *15/00*

U.S. Cl. 73—198 **1 Claim**



1. In a chemical plant including a duct for containing a liquid which in operation of the plant is caused to oscillate along the duct, a first transducer and a second transducer spaced apart along the duct and each arranged to transmit and receive ultrasonic pressure wave pulses through the liquid; means connected to the transducers for energizing the transducers; means for detecting the pulses received by the transducers, for determining therefrom the velocity of flow of the liquid, for producing a first signal comprising a series of pulses whose frequency is directly proportional to the magnitude of the velocity, and for producing a second signal representative of the direction of flow; and a counting means arranged to be controlled by the second signal so as to count the number of pulses of the first signal between consecutive occasions at which the direction of flow changes.

4,481,812

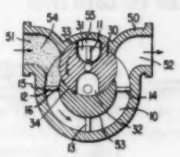
INTERNAL GATE ROTARY VANE FLUID METER WITH CONTROLLED ROTOR VANE ASPECT RATIO

Irwin A. Hicks, Radnor, Pa., assignor to The Singer Company, Stamford, Conn.

Filed May 13, 1983, Ser. No. 494,207

Int. Cl.³ G01F *3/08*

U.S. Cl. 73—253 **1 Claim**



1. In a fluid meter, the combination of a body having an inlet passage and an outlet passage, a crescent shaped member within the body defining therewith an arcuate channel communicating at opposite ends with said passages, respectively, said body and said crescent also defining an offset circular cavity intersecting the channel between the inlet and outlet passages, a rotor mounted on the body for rotation about an axis within the arcuate channel and the offset cavity, said rotor having at least one end plate with a plurality of vanes fixed to said at least one end plate, said vanes being adapted to move by fluid pressure through said arcuate channel and through said portion of said cavity, a gate mounted on the body for rotation about an axis parallel to the rotor axis within said offset cavity, said gate having a periphery provided with pockets therein for reception of the rotor vanes, the number of gate pockets not exceeding the number of rotor vanes, said gate having webs extending radially outward from a central hub between adjacent pockets, means for coupling said rotor to said gate to synchronize the passage of rotor vanes through gate pockets without the vanes contacting the gate webs, said coupling means providing a drive train for gate rotation from the rotor, said vanes being dimensioned to each have a length from said at least one end plate parallel to said rotor axis which does not exceed 1.5 times the width of said each vane as measured from the vane outer radius to the vane inner radius in a direction perpendicular to said rotor axis.

4,481,813

DEW SENSOR

Hirayoshi Tanei, Tokyo; Shoichi Iwanaga; Akira Ikegami, both of Yokohama; Hiroshi Otsu, Mito, and Hiromi Isonae, Nakaminato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 27, 1982, Ser. No. 436,944

Claims priority, application Japan, Oct. 28, 1981, 56-171414

Int. Cl.³ G01N *27/12*

U.S. Cl. 73—336.5 **11 Claims**

5. A dew sensor comprising a pair of counterposed electrodes; a humidity-sensitive layer, including an insulating po-

rous metal oxide, with a porosity of 20 to 60% provided on and between the counterposed electrodes; and an organic polymer coating layer having a thickness of 0.05 to 2 μm provided on

the humidity-sensitive layer, to thereby provide a dew sensor with a sharp decrease in resistance in a RH range of 95 to 100% and a response time of 5 minutes or less.

4,481,814

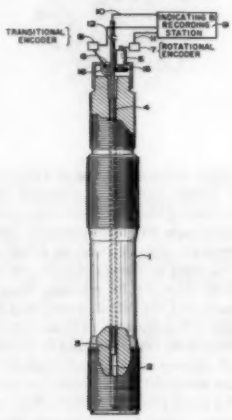
STUD INSPECTION SYSTEM

Timothy H. Wentzell, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 28, 1982, Ser. No. 392,844

Int. Cl.³ G01D *21/02*

U.S. Cl. 73—432 R **8 Claims**



1. In a system for positioning a sensing element within a bore and having a remote station at which the sensing element within the bore manifests the conditions sensed at specific locations within the bore, including,

a shaft mounted to extend its lower end vertically down the bore whose body is to be inspected,

a single set of gear teeth mounted on the external surface of the shaft through which both rotation and translation of the shaft is carried out,

said sensing element comprising a transducer used as a probe mounted on the lower end of the shaft to sense body conditions,

a first motor having a first gear mounted to horizontally engage the teeth on the external surface of the shaft for rotating the shaft,

a second motor having a second gear mounted to vertically engage the teeth on the external surface of the shaft to translate the shaft axially,

encoders connected to both motors to register the rotation of the motors as the position of the transducer within the bore,

and the station connected to the transducer and encoders to manifest the location of conditions sensed by the transducer within the bore.

4,481,815

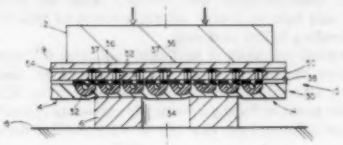
TACTILE SENSOR

Kenneth J. Overton, 15 Acrebrook Dr., Chicopee, Mass. 01020

Filed Dec. 23, 1982, Ser. No. 452,792

Int. Cl.³ G01D *7/02*; **H01C** *10/10*

U.S. Cl. 73—432 R **20 Claims**



1. In a tactile sensor for an object based on detecting the deflection pattern in a sensor surface caused by contact of the surface with the object, comprising

deflection-responsive sensor elements associated with said surface,

the elements having electrical paths the characteristics of which are dependent upon the forces applied to said elements, and

electrical circuitry connecting said elements to a means for determining a physical parameter of the object being sensed,

the improvement wherein:

said sensor elements comprise an array of discrete, elastomeric, electrically conductive, electrically force-sensitive forcel units electrically insulated from one another,

each forcel unit defining a local force-resolution region (forcel) for the resolution of the deflection pattern in said surface, and

said circuitry comprises a plurality of electrical channels, each sensor element being connected between a pair of the channels,

said channels being adapted to be electrically sensed to produce a set of signals representative of said deflection pattern in said surface.

4,481,816

PIPELINE GAUGING VEHICLES

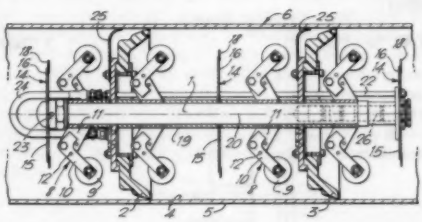
Ian Prentice, Bedlington, England, assignor to British Gas Corporation, London, England

Filed Feb. 14, 1983, Ser. No. 466,158

Claims priority, application United Kingdom, Mar. 24, 1982, 8208579

Int. Cl.³ G01B *5/12*

U.S. Cl. 73—432 R **12 Claims**



1. A pipeline gauging vehicle comprising:

(a) an axially extending support structure;

(b) at least one resilient driving cup mounted around the support structure so as to contact the interior wall of the pipeline and thus provide a pressure differential across the driving cup which will propel the vehicle along the pipeline;

(c) at least two first monitoring arrangements located at axially spaced positions on the support structure;

(d) each first monitoring arrangement consisting of at least three detecting elements located at circumferentially spaced positions around the support structure and at a predetermined radial distance from the longitudinal axis of the vehicle;

(e) the axial spacing of the first monitoring arrangements and the radial location of their individual detecting elements being commensurate with a minimum radius of curvature of bends in the pipeline which the vehicle needs to negotiate when travelling through the pipeline; and

(f) a plurality of second monitoring arrangements mounted at axially spaced positions along the support structure;

(g) each second monitoring arrangement having detecting portions radially spaced from the longitudinal axis of the vehicle by a distance commensurate with a predetermined minimum radial distance from the interior surface of the pipeline which must be clear when the vehicle is travelling through the pipeline;

(h) whereby the detecting portions engage the interior surface of the pipeline and provide an indication when said minimum radial distance is exceeded.

4,481,817

WORKPIECE LOADING APPARATUS

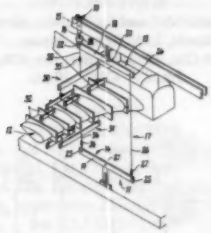
Christopher J. Ludowyk, South Brighton, and Stewart G. W. Gee, Glen Huntly, both of Australia, assignors to Commonwealth of Australia, Australia

Filed May 27, 1982, Ser. No. 382,674

Claims priority, application Australia, Jun. 2, 1981, PE9164

Int. Cl.³ G01M *5/00, 7/00*

U.S. Cl. 73—583 **2 Claims**



1. Workpiece loading apparatus for alternately applying force to workpiece from different directions, the apparatus including a single drive means, a drive frame to which the drive means is coupled such that the drive means can apply a force in either of two generally opposite directions to the drive frame, the drive frame having a first portion arranged to be located at one side of the workpiece and to be operatively associated with the workpiece so as to apply a force to the workpiece from one direction when the drive means is operated in one of its two directions and a second portion arranged to be located at the opposite side of the workpiece and to be operatively associated with the workpiece so as to apply a force to the workpiece from the opposite direction when the drive means is operated in the other of its two directions, the first and second portions of the drive frame each including a drive lever which is pivotally mounted to a respective fixed point in the vicinity of the workpiece, each drive lever including a drive end and an opposite follower end and being pivotally mounted so as to be movable about a point located between the drive and follower ends, the drive frame further including an elongated tension strap connected at its opposite ends to the respective follower ends of the two drive levers, the tension strap being operative to cause the drive levers to move synchronously.

4,481,818

METHOD OF DETECTING CRACKS IN CONSTRUCTIONS

Kjell A. Hellqvist, Genarp, Sweden, assignor to Kockums AB, Malmo, Sweden

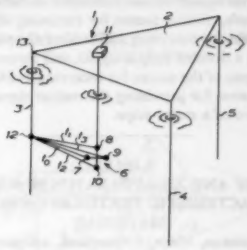
PCT No. PCT/SE81/00230, § 371 Date Apr. 19, 1982, § 102(e) Date Apr. 19, 1982, PCT Pub. No. WO82/00718, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 18, 1981, Ser. No. 375,126

Claims priority, application Sweden, Aug. 26, 1980, 8005963

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—587 **5 Claims**



1. A method for detecting the presence of cracks, the formation of cracks and the growth of cracks in constructions by recording and analysis of acoustic emissions from a crack in the construction, comprising:

(1) immersing in a liquid medium adjacent to construction, in spaced apart accurately-defined positions in relation to the construction, at least two sensors sensitive to the acoustic emissions from the crack to the medium;

(2) sensing and recording the acoustic emissions to said medium sensed by each sensor;

(3) measuring the differences in time between the sensing and recording of such acoustic emissions by each sensor; and

(4) determining from said differences in time the location of the crack.

4,481,819

METHOD AND APPARATUS FOR DETECTING METAL WIPE DAMAGES OF PLANE BEARING

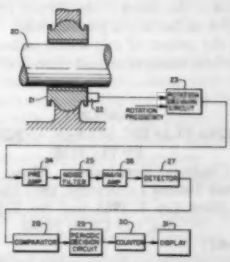
Takao Yoneyama; Ichiya Satoh; Sanshiro Obara; Tomoaki Inoue, and Tsuguaki Koga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 195,106, Oct. 8, 1980, abandoned. This application Feb. 9, 1983, Ser. No. 465,183

Claims priority, application Japan, Oct. 8, 1979, 54-128918

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—593 **12 Claims**



1. An apparatus for detecting a metal wipe of plane bearing means, the apparatus comprising means disposed in an area of

the plane bearing means for receiving an ultrasonic signal generated by the metal wipe and for producing an output signal thereof, means for receiving the output signal and for converting the same into a pulse signal, means for receiving and storing the pulse signals received over a predetermined period of time, means for computing a ratio of a stored pulse signal with a previously predetermined period of time to a currently stored pulse signal and for providing an output signal indicative of an occurrence of the metal wipe, said means for computing a ratio includes a gate circuit means for receiving a pulse signal from said means for receiving and converting, means for operating the gate circuit means so as to provide for alternate output signals to said means for receiving and storing the pulse signals, divider means for receiving an output signal from said means for receiving and storing the pulse signals and for providing a divided output signal, and means responsive to the output signal of the means for receiving and converting and the divider means for providing the output signal indicative of the occurrence of a metal wipe.

4,481,820

METHOD OF AND AN APPARATUS FOR MEASURING CHARACTERISTIC FEATURES OF FIBROUS MATERIAL

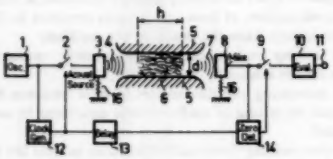
Christoph Thomann, Maur, Switzerland, assignor to Zellweger Uster Ltd., Uster, Switzerland

Filed Dec. 14, 1982, Ser. No. 449,616

Claims priority, application Switzerland, Jan. 18, 1982, 269/82; Jan. 18, 1982, 270/82

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—597 **30 Claims**



1. A method of measuring characteristic features of fibrous material, including measuring the quantity of fibers of textile slivers using sound waves, comprising the steps of

directing sound waves which emanate from at least one sound source through the fibrous material so that the sound waves penetrate the fibrous material on their way to at least one sound pick-up, the intensity of the sound waves being damped and the propagation time of the sound waves being delayed according to the quantity of fibers in said fibrous material;

positioning the sound source, fibrous material and sound pick-up such that only the sound waves which penetrate and travel in the fibers of the fibrous material on a direct path arrive at the sound pick-up; and

evaluating the output of said sound pick-up to measure the characteristic features of said fibrous material.

4,481,821

ELECTRO-ELASTIC SELF-SCANNING CRACK DETECTOR

Jacques R. Chamuel, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 8, 1983, Ser. No. 521,114

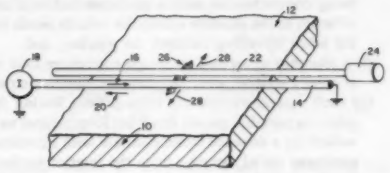
Int. Cl.³ G01N *29/04*

U.S. Cl. 73—617 **19 Claims**

1. Apparatus for sensing the presence and location of defects in a workpiece having a surface to be inspected comprising:

a medium capable of supporting travelling acoustic waves having at least one region adapted to couple to an acoustic sensor, said medium adapted to lie proximate, to a portion of said workpiece surface;

means for activating the workpiece simultaneously along said portion to cause generation of acoustic waves within said medium originating at locations proximate to irregularities in said portion of said workpiece;



at least one acoustic sensor coupled to said generated acoustic waves at said at least one of said medium regions, each of said sensors being operative to produce an output signal indicative of received acoustic waves;

the timing of output signal generation by each of said sensors with respect to workpiece activation being indicative of the presence and location of defects within said workpiece.

4,481,822

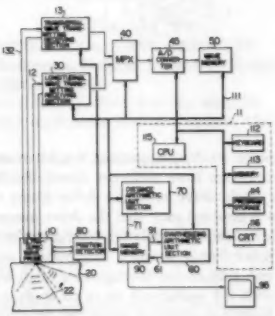
SYNTHETIC APERTURE ULTRASONIC TESTING APPARATUS WITH SHEAR AND LONGITUDINAL WAVE MODES

Jun Kubota; Junichi Ishii, and Soji Sasaki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,879

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—625 **9 Claims**



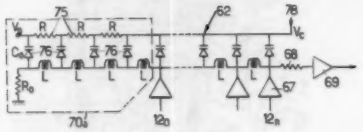
1. An ultrasonic synthetic aperture testing apparatus comprising transmitting/receiving sections having an ultrasonic probe for transmitting and receiving ultrasonic waves at multiple points on the surface of a to-be-tested object, an operation section including means for accumulating the received signals corresponding to the distances between said multiple points and a reproduction point in a desired region of said object, and a display section which displays an image formed by the result of an accumulation operation by said accumulation means, said ultrasonic probe including at least two vibrators corresponding to different vibration modes for enabling two kinds of ultrasonic waves in different vibration modes to be transmitted and received, said accumulation means accumulating said two kinds of waves in the different vibration modes.

4,481,823

ULTRASONIC PROBING DEVICES

Pierre Alais, Dampierre, France, assignor to Centre National de la Recherche Scientific, Paris, France

PCT No. PCT/FR81/00139, § 371 Date Jun. 22, 1982, § 102(e) Date Jun. 22, 1982
PCT Filed Oct. 26, 1981, Ser. No. 394,913
Claims priority, application France, Oct. 24, 1980, 80 22880
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—626 **9 Claims**



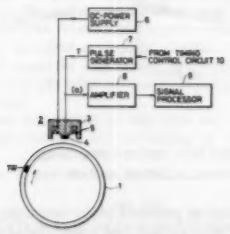
9. A device for focusing an ultrasonic image received by an array of elementary transducers, said device comprising a delay line having a plurality of serially connected electrically controllable delay cells each providing a predetermined time delay, and having one of its ends connected to a matched termination, taps provided between sucessive ones of said cells, a plurality of voltage-current amplifiers each connecting an individual one of said transducers to one of said taps in accordance with a connection pattern which provides focussing at predetermined distance from said array, amplifier means connected to the other end of said delay lines for summing the signals received from said transducers, and means for simultaneous and progressive control of all of said cells for modifying the time delays provided by said cells while maintaining the same ratio between the time delays provided by said cells, said array of elementary transducers comprising a plurality of elemetary transducers in the form of segments of rings of different radii and together forming an off-center probe.

4,481,824

WELD DETECTOR

Minoru Fujimoto, and Akihiro Tanaka, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1982, Ser. No. 411,880
Claims priority, application Japan, Sep. 4, 1981, 56-138464
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—643 **20 Claims**



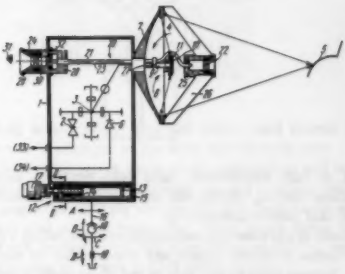
1. A weld detector for locating a weld in metal materials comprising: an ultrasonic wave generating means for producing transverse ultrasonic waves electromagnetically for propagation in the metal material from an outer surface toward an inner surface of the metal material in a direction of the thickness of the metal material; an ultrasonic wave detecting means for detecting the transverse ultrasonic waves propagated in the metal material and reflected by the inner surface of the metal material; and signal processor means for processing signals of an amplitude of the reflected transverse ultrasonic waves detected by the ultrasonic wave detecting means to locate the weld according to the amplitude of the detected ultrasonic wave signals.

4,481,825

DEVICE FOR MEASUREMENT OF VIBRATIONS

Vladimir V. Kljuev; Valery P. Kozlov; Alexandr P. Degterev; Irina A. Vainberg; Vladimir V. Demidov, all of Moscow, U.S.S.R., and Anatoly N. Filimonov, deceased, late of Moscow, U.S.S.R. (by Elena V. Filimonova, administrator), assignors to Nauchno-Issledovatelsky Institut Introskopii, Moscow, U.S.S.R.

Filed Feb. 22, 1983, Ser. No. 468,063
Int. Cl.³ G01H *9/00*
U.S. Cl. 73—655 **3 Claims**



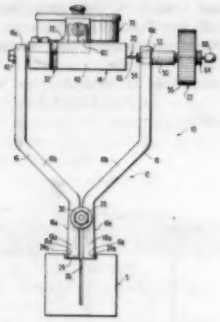
1. A device for measurement of vibrations, comprising:
a microwave generator generating energy;
an antenna system mounted behind said microwave generator in the direction of progagation of said energy, said antenna system directing the energy to an object to be investigated and comprises the following units:
a radiator installed behind said microwave generator in the direction of propagation of its energy and receiving this energy;
an elliptical mirror having a first focal point near said mirror and a second focal point remote from said mirror, said radiator being disposed at said first focal point and irradiating the entire surface of said mirror, the object to be investigated being located in the immediate vicinity of the second focal point, said object receiving the energy radiated by said mirror and reflecting this energy;
a detector disposed so that it receives all the energy reflected from said investigated object through said mirror and said radiator and the energy of reference high-frequency oscillations, and said energies when mixed producing a frequency-modulated signal carrying information on the parameters of the vibration of said object being investigated;
an optical guidance system for aiming said mirror of said antenna system at said object being investigated, said optical guidance system being installed so that its optical axis coincides with the axis of said mirror; and
said optical guidance system for aiming said mirror of said antenna system at said object comprises:
an objective disposed in front of said radiator as viewed from said object being investigated;
a light guide for transmission of an image of said object having a first end face and a second end face, the first end face of said light guide being disposed in the focal plane of said objective as viewed from said radiator of said antenna system; and
an ocular disposed behind the second end face of said light guide.

4,481,826

HAND HELD, DIRECT READING, FULLY MECHANICAL FRACTURE LOADING DEVICE FOR SHORT ROD/BAR SPECIMENS

Anthony R. Ingraffea, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Feb. 2, 1983, Ser. No. 463,358
Int. Cl.³ G01N *19/08*
U.S. Cl. 73—799 **7 Claims**



1. A fully mechanical, hand held, portable, direct reading fracture loading device for short rod/bar specimens and the like, said device comprising:

force application expandable jaws constituting a pair of lever arms pivotably connected intermediate of their ends and having ends to one side of the pivot point engaging opposite sides of a slotted test specimen such that when the ends of the lever arms in contact with the specimen are pivoted apart, the test specimen splits,

a mechanical force gauge including a spring flexure member interposed between the ends of the lever arms remote from the specimen, and

means for applying a mechanical force for drawing the ends of the lever arms bearing the mechanical force gauge towards each other through said spring flexure member such that flexure of said spring flexure member is a direct measure of the load applied to the test specimen through the lever arms to effect fracture thereof.

4,481,827

BLOOD FRACTIONATION APPARATUS HAVING COLLECTION RATE DISPLAY SYSTEM

Arnold C. Bilstad, Deerfield, and John T. Foley, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

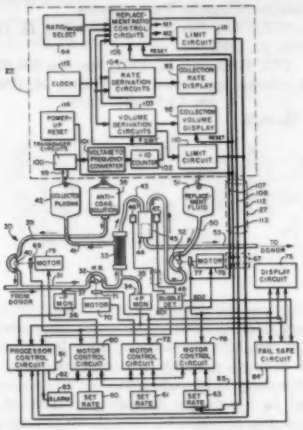
Filed Dec. 15, 1981, Ser. No. 330,901
Int. Cl.³ G01F *1/00*
U.S. Cl. 73—861 **25 Claims**

1. In a fluid collection apparatus for collecting fluid in a collection container, a collection rate monitoring system comprising, in combination:

weight responsive means including an electrical transducer in supporting relationship to the collection container for providing an output signal indicative of the weight of the collection chamber and the collected fluid contained therein;

comparison means for repetitively comparing said transducer output signal over a measurement interval with said output signal over a preceding measurement interval to develop a collection signal indicative of the volume of fluid collected during the interval;

accumulator means comprising a counter for developing the sum of said collection signals over a predetermined number of the most recent of said collection intervals corresponding to a unit of time; and



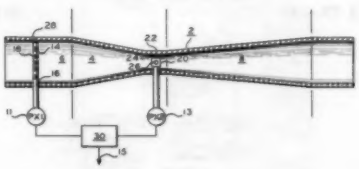
rate derivation means for periodically developing from the sum of said incremental collection signals in said counter an output signal indicative of the collection rate.

4,481,828

DIFFERENTIAL FLOW RATE SENSOR

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 27, 1983, Ser. No. 461,315
Int. Cl.³ G01N *7/00*
U.S. Cl. 73—861.63 **2 Claims**



1. A venturi tube flow meter comprising:

(a) an inlet section, a throat section and a recovery cone section;

(b) a first cylindrical pressure probe extending through one wall of said inlet section and transversing a diameter of said inlet section up-stream of said throat section, said first pressure probe closed at its inner end and containing a plurality of up-stream facing perforations;

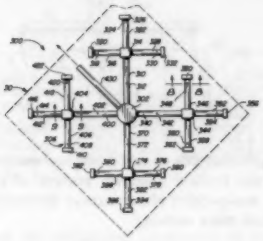
(c) a second pressure probe extending through the wall of said throat section into the flow path of said throat section at the minimum diameter of said throat section, said second pressure probe closed at the end within said throat section and containing two perforations 180° apart and orthogonal to the center line of said throat section; and

(d) means connected to said pressure probes external to said venturi tube to sense difference of pressure therebetween.

4,481,829
MANIFOLD APPARATUS FOR AIRFLOW SENSING EQUIPMENT

Ernest R. Shortridge, 5024 E. Desert Park La., Paradise Valley, Ariz. 85253

Filed Feb. 1, 1983, Ser. No. 463,028
Int. Cl.³ G01F *1/46*
U.S. Cl. 73—861.66 **21 Claims**



1. Manifold apparatus for sensing a pressure differential in an airflow, comprising, in combination:

first manifold means for sensing total pressure in the airflow, including

first manifold hub means,

a first plurality of manifold runners secured to the manifold hub means and extending outwardly therefrom,

a first plurality of runner arms connected to the plurality of manifold runners,

a first plurality of apertures extending through the first plurality of manifold runners and the first plurality of runner arms for providing communication between the airflow total pressure and the respective manifold runners and runner arms, and

a first manifold connector conduit connected to the first manifold hub means and communicating with the first plurality of manifold runners and manifold arms;

second manifold means for sensing airflow static pressure, including

second manifold hub means,

a second plurality of manifold runners secured to the second manifold hub means and extending outwardly therefrom,

a second plurality of runner arms connected to the second plurality of manifold runners,

a second plurality of apertures extending through the second plurality of manifold runners and the second plurality of runner arms for providing communication between the airflow static air pressure and the respective manifold runners and runner arms, and

a second manifold connector conduit connected to the second manifold hub means and communicating with the second plurality of manifold runners and manifold arms; and

meter means connected to the first and second manifold connector conduits for providing an indication of the airflow.

4,481,830
APPARATUS FOR MEASURING FLUID FLOW

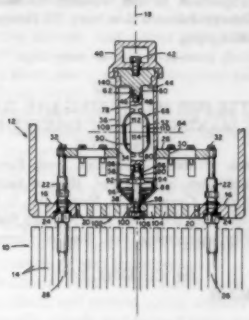
Jack E. Smith, Knoxville, and David G. Thomas, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1983, Ser. No. 455,612
Int. Cl.³ G01F *1/05;* G01L *9/04;* G21C *17/02*
U.S. Cl. 73—861.71 **6 Claims**

1. Apparatus for measuring fluid flow in a stream having a variable flow rate comprising:

an obround support loop having a fixed end and a movable end and first and second sides comprising flexible strips extending between said fixed and movable ends whereby displacement of said movable end relative to said fixed end is accompanied by flexing of said sides, said first and second sides each having inner and outer surfaces;

movable drag means attached to said movable end of said support loop for causing displacement of said movable end in response to changes in the flow rate of said stream,



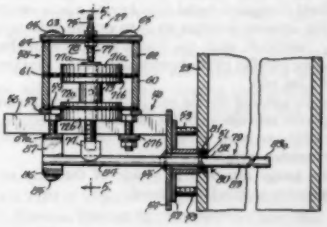
said drag means being disposed within said stream and responsive to changes in the flow rate thereof; and

a first pair of strain gages respectively attached to said outer surfaces of said first and second sides and a second pair of strain gages respectively attached to said inner surfaces of said first and second sides, said strain gages being connected in a bridge circuit for generating an electric signal proportionate to strains in said strain gages.

4,481,831
FLUENT SOLID MATERIAL FLOW TRANSDUCER

Elwood R. Margison, Downers Grove, Ill., assignor to United Conveyor Corporation, Deerfield, Ill.

Filed Apr. 13, 1983, Ser. No. 485,223
Int. Cl.³ G01F *1/30*
U.S. Cl. 73—861.73 **20 Claims**



1. A fluent solid material flow transducer comprising, in combination:

a frame adapted to be mounted on the exterior of a conduit in a fluent solid material transporting system;

a load cell in said frame, said load cell comprising a sealed chamber, means for passing air through said chamber at a constant flow rate, said means including an air inlet pipe, an air outlet pipe and a bleed nozzle having a small variable orifice, and linearly movable means for varying the orifice;

an effectively friction free sealed pivot secured to said frame in a hole in the conduit;

and a sensor member mounted on said pivot, said sensor member having a sensing arm extending into the conduit

and a force arm outside the conduit for moving said linearly movable means,

the relationship between the bleed nozzle orifice and the linearly movable means being such that when no pulverulent material is passing through the conduit, air from the chamber bleeds freely to atmosphere, while the impact of material on the sensing arm causes the force arm to move the linearly movable means to vary the bleed nozzle orifice in proportion to the volume of material passing through the conduit and thus vary the flow of air through the air outlet pipe.

4,481,832

TEST CASSETTE FOR MEASURING THE TORQUE OF A WINDING MANDREL OF A CASSETTE-PLAYING APPARATUS

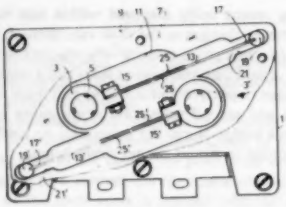
Klaus Kommoss, Wetzlar-Naunheim, and Erhard Schmidt, Giessen-Lützellinden, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1982, Ser. No. 421,938

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142685

Int. Cl.³ G01L *3/00*

U.S. Cl. 73—862.08 **9 Claims**



1. A test cassette for measuring the torque of a winding mandrel of a tape cassette apparatus, comprising

a housing;

an annular member having a central axis, said member being rotatably supported in the housing so as to permit rotation about said central axis, and being arranged for engagement with a winding mandrel of a tape cassette apparatus to receive torque therefrom;

a resilient elongated metal strip having a near end connected to the annular member so as to extend substantially radially therefrom with the lateral direction of the strip extending parallel to the central axis of the annular member, and a far end;

means for guiding the far end in the housing, so arranged as to permit movement of the far end in a direction such that the strip can bend under the action of torque imparted to the annular member by the mandrel; and

a strain gauge attached to a side of the strip so as to be responsive to bending thereof.

4,481,833

PARTICLE EXCLUDING SAMPLE PROBE

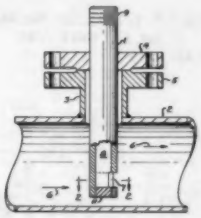
Walter A. Bajek, Lombard, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 27, 1982, Ser. No. 453,038

Int. Cl.³ G01N *1/20*

U.S. Cl. 73—863.21 **12 Claims**

1. A sampling probe to remove a sample of fluid from a particulate matter-containing fluid stream flowing in a conduit which comprises a probe situated relatively perpendicular to said conduit and having a longitudinal axis and an elongated body with an exterior portion and a hollow interior communicating with said fluid stream by means of at least one fluid entry opening in said body, said at least one fluid entry opening facing substantially downstream, wherein said exterior portion of said probe situated opposite said at least one fluid entry opening is comprised of two non-parallel planes, such that a line formed by joining said two non-parallel planes is parallel



to said longitudinal axis of said probe and such that said line is located at the furthest upstream portion of said probe and where said non-parallel planes extend downstream of said at least one fluid entry opening.

4,481,834

BALANCE DEVICE FOR A MECHANICAL PRESS

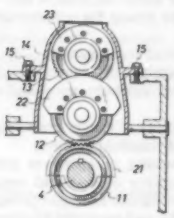
Mitsuo Sato, Kanagawa, and Yuu Takahashi, Tokyo, both of Japan, assignors to Aida Engineering, Ltd.

Filed Sep. 9, 1982, Ser. No. 416,220

Claims priority, application Japan, Mar. 16, 1982, 57-41156

Int. Cl.³ F16H *21/22*; G05G *1/00*

U.S. Cl. 74—44 **6 Claims**

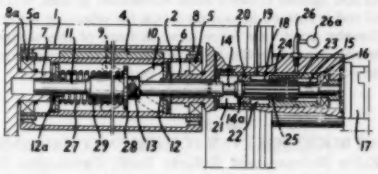


1. Balance device for a mechanical press comprising a press body, an axially extending crankshaft rotatably mounted on said press body, connecting rods mounted on and spaced apart in the axial direction of said crankshaft, a slide attached to said connecting rods for reciprocal movement in a direction transverse of the axial direction of said crankshaft, a first gear positioned on said crankshaft for rotation therewith and positioned approximately midway between said slides, a plurality of balancing gears mounted on said press body, each of said balancing gears having the same number of teeth as said first gear with one of said balancing gears in meshed engagement with said first gear and located on the opposite side of said crankshaft from said slides and at least one other said balancing gear is meshed engagement with the one of said balancing gears and located on the opposite side of said one of said balancing gears from said crankshaft, balancing weights connected to each of said first gear and said balancing gears for counteracting the tendency of said slide to cause oscillation and vibration in said press body, and the center of said first gear and said balancing gears being aligned one above the other.

4,481,835
DEVICE FOR CONTINUOUS ADJUSTMENT OF THE VIBRATION AMPLITUDE OF ECCENTRIC ELEMENTS

Stig Storm, Bromolla, Sweden, assignor to Dynapac Maskin AB, Solna, Sweden

Filed Oct. 20, 1982, Ser. No. 435,618
Claims priority, application Sweden, Oct. 28, 1981, 8106358
Int. Cl.³ F16H *33/20*
U.S. Cl. 74—61 **4 Claims**

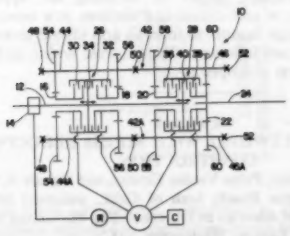


1. Apparatus for continuous adjustment of the vibration amplitude of a rotating eccentric element comprising means for mounting two concentric tubular eccentric weights for rotation in relation to each other, a drive shaft extending through the eccentric weights, means for mounting the drive shaft for axial movement relative to the eccentric weights, means for connecting the drive shaft to the eccentric weights, said connecting means providing for rotation of the eccentric weights upon rotation of the drive shaft to generate vibrations, said connecting means also providing for the rotation of the eccentric weights relative to each other when the drive shaft is moved axially of the tubular eccentric weights, a hydraulic cylinder, a piston in the hydraulic cylinder, means for supplying hydraulic fluid to the cylinder to move the piston axially, a connecting rod extending through the piston and cylinder, means for journalling the rod in the piston for rotation relative to the piston without axial movement relative to the piston, one end of the connecting rod being rigidly connected to the drive shaft, and means for coupling the other end of the connecting rod to a power source for rotating the drive shaft.

4,481,836
MULTIPLE IDENTICAL COUNTERSHAFT POWERSHIFT TRANSMISSION

Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 12, 1982, Ser. No. 348,527
Int. Cl.³ F16H *3/08, 57/02;* F16D *21/02*
U.S. Cl. 74—331 **6 Claims**



1. A four speed change speed powershift transmission mechanism (10) comprising:

a transmission housing (132);

a rotatable input (12) shaft rotatably supported in said transmission housing;

a first input gear (161) coaxially surrounding said input shaft and rotatable relative thereto;

a second input gear (18) coaxially surrounding said input shaft and rotatable relative thereto, said second input gear axially spaced from said first input gear in a first axial direction;

a third input gear (20) coaxially surrounding said input shaft and rotatable relative thereto, said third input gear axially spaced from said second input gear in said first axial direction whereby said second input gear is axially interposed said first and third input gears;

an output gear (22) coaxial with said input shaft and rotatable relative thereto, said output gear axially spaced from said third input gear in said first axial direction whereby said third input gear is axially interposed said second input gear and said output gear;

an output shaft (24) generally coaxial with said input shaft rotatably supported in said housing, said output gear rotationally fixed to said output shaft;

said transmission characterized by:

a first frictional clutch (30) coaxial with and driven by said input shaft said first clutch selectively engageable to rotationally couple said first input gear to said input shaft, engagement of said first clutch effective to provide first speed operation of said transmission;

a second frictional clutch (32) coaxial with and driven by said input shaft, said second clutch selectively engageable to rotationally couple said second input gear to said input shaft, engagement of said second clutch effective to provide third speed operation of said transmission;

a third frictional clutch (36) coaxial with and driven by said input shaft, said third clutch selectively engageable to rotationally couple said third input gear to said input shaft, engagement of said third clutch effective to provide second speed operation of said transmission;

a fourth frictional clutch (38) coaxial with and driven by said input shaft, said fourth clutch selectively engageable to rotationally couple said output gear to said input shaft, engagement of said fourth clutch effective to provide fourth speed operation of said transmission;

said first and second frictional clutches comprising a first double acting frictional clutch mechanism (26) axially interposed said first and second input gears and said third and fourth frictional clutches comprising a second double acting clutch mechanism (28) axially interposed said third and fourth input gears;

a plurality of substantially identical countershafts (42, 42A) rotatably supported in said housing, each of said countershafts carrying a first (54), second (56), third (58) and fourth (60) countershaft gear fixed thereto, said countershaft gears constantly meshed with said first, second and third input gears and said output gear, respectively; and

control means for engaging and disengaging said clutch means, said control means causing overlapping engagement of the clutch means being engaged and the clutch means being released.

4,481,837
MULTIPLE SPEED GEAR TRANSMISSION

Wallace G. Stevens, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00933, § 371 Date Jul. 12, 1982, § 102(e) Date Jul. 12, 1982, PCT Pub. No. WO84/00408, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 12, 1982, Ser. No. 414,284
Int. Cl.³ F16H *3/22*
U.S. Cl. 74—342 **8 Claims**

1. A multiple speed gear transmission of the sliding gear type comprising:

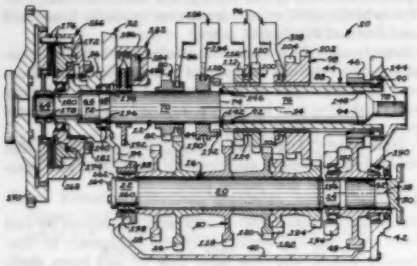
an input shaft disposed on a first axis and having a distal end portion serving as a power take-off;

a layshaft disposed on a second axis and having a plurality of drive gears connected for joint rotation therewith;

first sliding gear means for selectively driving the layshaft in either direction of rotation in response to unidirectional rotation of the input shaft;

a tubular output shaft disposed on the first axis and receiving the distal end portion therewithin;

second sliding gear means for connecting one of the drive gears drivingly to the tubular output shaft;



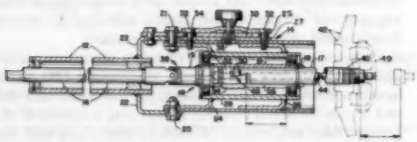
an output gear rotatably supported on the second axis; and output means for connecting the tubular output shaft drivingly to the output gear.

4,481,838

ADJUSTABLE STEERING SHAFT

Samuel A. Findley, Coldwater, and Duane T. Kubasiak, Bronson, both of Mich., assignors to Douglas Components Corporation, Bronson, Mich.

Filed Apr. 19, 1982, Ser. No. 369,495
Int. Cl.³ B62D *1/18*
U.S. Cl. 74—493 **12 Claims**



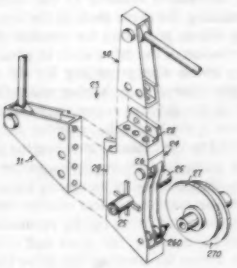
1. An adjustable steering column for a vehicle comprising a lower column portion fixed against rotation, a lower steering shaft portion rotatably mounted within the lower column portion and adapted to control steering means for the vehicle, an upper column portion, means for pivotally mounting the upper column portion to the lower column portion for pivotal movement between a plurality of pivotal positions, means for manually locking the upper column portion in a selected one of said plurality of pivotal positions, an upper steering shaft portion rotatably mounted within the upper column portion, a universal joint connecting the upper and lower steering shaft portions at said means for pivotally mounting the upper steering shaft portion, said upper steering shaft portion including upper and lower sub-portions at least one of which is a quill shaft, said sub-portions being associated in telescoping relationship with one being the outermost of the two and the other the innermost, the lower end of the lower telescoping sub-portion being directly connected to the universal joint, steering wheel mounting means at the upper end of the upper telescoping sub-portion, a manually rotatable control rod mounted in and extending through the upper sub-portion and having manually drivable rotation means at its upper end and screw threads adjacent its lower end, an inclined first cam surface at an end of the innermost of the sub-portions, a wedge plug telescoped within the outermost of said sub-portions, the wedge plug having an inclined second cam surface engageable with the first cam surface whereby axial shifting of the wedge plug in a locking direction with respect to the said innermost sub-portion forces the inclined first and second cam surfaces together to force the plug and said innermost sub-portion into locking engagement with said outermost sub-portion, and axial shifting of the wedge plug in a releasing direction with respect to said innermost sub-portion releases said locking engagement, the wedge plug and said innermost sub-portion surrounding the lower end of the rotatable control rod with one of them threadedly engaged with the control rod for axial shifting of the wedge plug and innermost sub-portion, relative to each other and in response to rotation of the rod, in directions for respective locking and releasing movement, and means for locking the rotatable control rod and the one of said innermost sub-portion and wedge plug that is not threadedly engaged with the control rod against relative axial movement at least when the control rod is rotated in said direction for releasing movement to thereby positively force axial shifting of the wedge plug in the releasing direction with respect to said innermost sub-portion of said upper steering shaft portion.

4,481,839

MODULAR ROCKING LEVER FOR CAM MECHANISMS

Antonio Zullo, Bologna, and Roberto Roffi, Casalecchio di Reno, both of Italy, assignors to Sasib S.p.A., Bologna, Italy

Filed Apr. 12, 1982, Ser. No. 367,789
Claims priority, application Italy, Apr. 23, 1981, 12510 A/81
Int. Cl.³ F16H *53/06*
U.S. Cl. 74—569 **2 Claims**



2. A modular rocking lever comprising in combination:

a modular base piece having a hollow box-type structure and being provided with trunnions forming a pivot axis for said lever, and with two connecting surfaces which are perpendicular to one another and which each have at least an elongated portion which forms an edge of said base piece and whose longitudinal axis is perpendicular to said pivot axis; the edge of said base piece opposite to one of said portions of said connecting surfaces is open; a modular appendix piece of a desired length and having a hollow box-type structure; means for fastening said appendix piece to one of said connecting surfaces in a removable and changeable manner to form an arm of said lever; and at least one cam follower roller mounted within said base piece adjacent said open edge.

4,481,840

LAYERED FLYWHEEL WITH STRESS REDUCING CONSTRUCTION

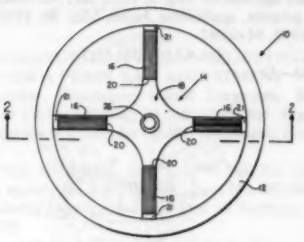
Johan A. Friedericy, Palos Verdes Estates, and Dennis A. Towgood, Huntington Beach, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 2, 1981, Ser. No. 326,466
Int. Cl.³ G05G *3/00*
U.S. Cl. 74—572 **53 Claims**

1. A flywheel comprising a hub rotatable about an axis of rotation, at least a first plurality of spokes extending radially from said hub which cooperate to define a first radial plane transverse to said axis of rotation, and an annular rim in torque-transmitting engagement with said spokes;

said hub including a member defining an axially extending pintle shaft substantially defining said axis, said member also defining a plurality of radially extending portions each axially contiguous to one spoke of said first plurality of radially extending portions respectively to said first plurality of spokes within a radially extending area thereof, each of said plurality of radially extending portions decreasing in transverse cross sectional area with increasing radius within said radially extending area;

each of said first plurality of spokes defining a radially inner end spaced outwardly of said axis of rotation;



said hub further including an axially extending center piece which is axially coextensive with said first plurality of spokes, said center piece defining an outer surface confronting said inner ends of said first plurality of spokes;

adhesive means for bonding said outer surface of said center piece to said inner ends of said first plurality of spokes, and for securing said center piece to said member;

said hub including a second plurality of radially extending spokes cooperating to define a second transverse radial plane, said first and second plurality of spokes axially sandwiching a portion of said radially extending portions of said member therebetween.

4,481,841

MULTIPLE ENGINE DRIVE ARRANGEMENT

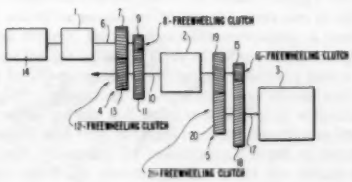
Jörg Abthoff, Plüderhausen; Hans-Dieter Schuster, Schorndorf, and Karlwalter Schmidt, Weinstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,865

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045093

Int. Cl.³ F16H *37/06;* **F16D** *41/04;* **F01B** *21/04;* **B60K** *1/00*

U.S. Cl. 74—661 **13 Claims**



1. A drive arrangement comprising at least two internal combustion engines and connecting means for connecting the internal combustion engines to each other in such a manner that both engines drive a common output shaft or each engine is individually operable, characterized in that the connecting means includes a force transmission means arranged between the engines, said force transmission means includes a plurality of gear means each operatively adapted to transmit at different transmission ratios and provide opposing force flows, each of the gear means includes a free wheeling clutch means connected to an output shaft of the respective engines, in that the respective free wheeling clutch means are arranged such that only one of the gear means acts at a given time in a direction of force transmission, and in that the plurality of gear means includes a first spur gear mounted on an output shaft of a first of the engines for rotation therewith, a second gear means mounted on the output shaft of the first engine by a free wheeling clutch means, a second spur gear meshing with the second gear means and mounted on an output shaft of a second engine for rotation therewith, and a further gear means meshing with the first spur gear and mounted on the output shaft of the second engine by another free wheeling clutch means.

4,481,842

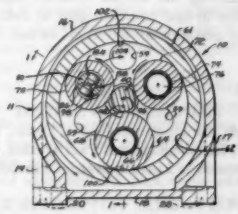
TORQUE LIMIT DRIVE TRANSMISSION

Bertel S. Nelson, Naperville, Ill., assignor to Wedgtrac Corporation, Yorkville, Ill.

Continuation of Ser. No. 297,744, Aug. 31, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,863

Int. Cl.³ F16H *13/06, 13/02*

U.S. Cl. 74—798 **11 Claims**



1. Roller friction gearing comprising a driving shaft, a driven shaft, the center lines of said shafts being parallel but offset radially of one another, an external annular roller-engaging surface secured to one of said shafts, means secured to the other of said shafts and having an internal annular roller-engaging surface, the spacing between said surfaces varying due to the offset of the center lines of said shafts and providing a narrowing pocket between said surfaces in the direction of rotation of the driving shaft, a plurality of rollers between said surfaces and acting to transmit torque from said driving shaft to said driven shaft, one of said rollers being a wedging roller of predetermined outside diameter mounted in said pocket and capable of moving further into said pocket as torque transmitted between said shafts causes relative deformation thereof, and positive means for limiting movement of said one roller substantially radially thereof a predetermined distance into said pocket to induce slip between said rollers and said surfaces to limit the torque that can be transmitted from said driving shaft to said driven shaft, said predetermined distance being very small compared to said predetermined diameter.

4,481,843

AUTOMATIC TRANSMISSION

Roger P. Jarvis, and Harry M. Windsor, both of Leamington Spa, England, assignors to Automotive Products Limited, Leamington Spa, England

Filed Feb. 10, 1982, Ser. No. 347,463

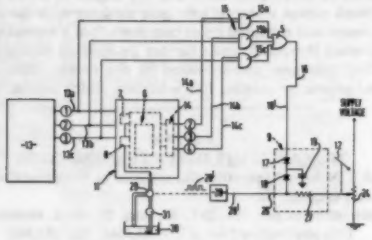
Claims priority, application United Kingdom, Feb. 12, 1981, 8104385

Int. Cl.³ B60K *41/08, 41/28*

U.S. Cl. 74—866 **10 Claims**

1. A control system for a rotary power transmission having means for providing a series of speed ratios, a pump for delivering fluid under pressure, speed ratio selectors selectively engageable by means of the fluid pressure to enable drive to be transmitted through the transmission, and regulator means for regulating the fluid pressure in response to an engine demand

signal, said control system including sensor means arranged to provide a sensor signal which indicates a state of engagement or disengagement of a speed ratio, command means arranged to provide a command signal which causes the selector means to select a different speed ratio, said command means being operable in response to transmission operating parameters,



logic means arranged to receive said sensor signal and command signal and which in response thereto provides a control signal for modifying the torque demand signal, and delay means responsive to said control signal to delay the effect of initiation and/or cessation of said signal on said torque demand signal.

4,481,844

TRANSMISSION SYSTEM

John M. Ironside, Birmingham; Nigel A. Deller, Warwick; Clive R. Sainsbury, Birmingham, and Paul Weston, Solihull, all of England, assignors to Lucas Industries Limited, Brimingham, England

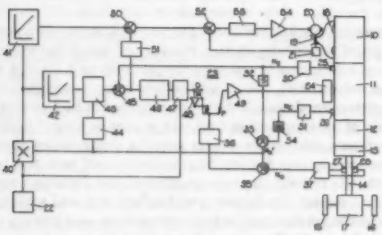
PCT No. PCT/GB 81/00135, § 371 Date Feb. 2, 1982, § 102(e) Date Feb. 2, 1982, PCT Pub. No. WO 82/00271, PCT Pub. Date Feb. 4, 1982

This PCT application filed Feb. 2, 1982, Ser. No. 355,554

Claims priority, application United Kingdom, Jul. 10, 1980, 8022569

Int. Cl.³ B60K *41/18, 41/12*

U.S. Cl. 74—866 **8 Claims**



1. A transmission system comprising a gear train (11,12) and means for controlling the gear train, said gear train comprising continuously variable gearing (11) having an input shaft (60), an output shaft (63) and an operating mechanism for controlling the gear ratio, and split path gearing (12) driven by the continuously variable gearing (11) having an output shaft and means (13) for disconnecting drive from the output shaft (74), said control means including an actuator (24) for driving the operating mechanism, characterized in that the control means further includes transducer means (25 to 28) mounted on the gear train, means (30 to 34, 37) responsive to the transducer means (25 to 28) for estimating the output shaft speed of the split path gearing (12) associated with a prevailing setting of the continuously variable gearing (11) when drive is disconnected from the output shaft (74), means (35) for comparing the estimated shaft speed with the actual output shaft speed, and means (36, 49) responsive to the comparing means (35) for providing a control signal to the actuator (24) so as to equalize the estimated shaft speed with the actual output shaft speed when drive is disconnected from the output shaft (14).

4,481,845

METHOD AND APPARATUS FOR CONTROLLING THE FEEDING OF A BANDSAW BLADE OF HORIZONTAL BANDSAW MACHINES

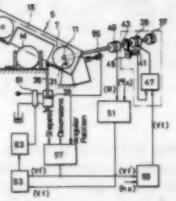
Nobuo Sakurai, Yokohama, and Kikuo Moriya, Machida, both of Japan, assignors to Amada Company, Limited, Isehara, Japan

Division of Ser. No. 154,108, May 28, 1980, Pat. No. 4,357,848. This application Aug. 2, 1982, Ser. No. 404,522

Claims priority, application Japan, May 30, 1979, 54-66061; May 30, 1979, 54-66062

Int. Cl.³ B23D *53/04*

U.S. Cl. 83—13 **4 Claims**



1. A method for controlling the feeding of the bandsaw blade of horizontal bandsaw machines comprising the steps of generating feeding signals for feeding the bandsaw into a material to be cut, generating driving signals for driving the bandsaw blade, detecting the cutting resistance of the material to be cut, controlling the driving speed of said bandsaw in response to said driving signals to provide a constant ratio of cutting resistance to driving speed and to provide a constant cutting power, and controlling the feeding of said bandsaw in response to said feeding signals to provide a constant ratio of feeding speed to blade driving speed during the cutting operation of the material to be cut and to provide a constant cutting rate.

4,481,846

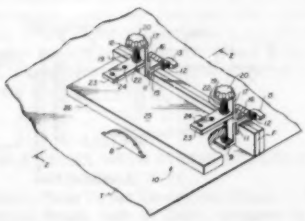
OVERHEAD FENCE ASSEMBLY

Chester E. Goodell, 1380 Zephyr Way, Sparks, Nev. 89431

Filed Feb. 26, 1982, Ser. No. 352,934

Int. Cl.³ B26D *7/06*; B23D *53/02*; B27C *1/12*; B32Q *3/00*

U.S. Cl. 83—438 **16 Claims**



1. An overhead fence guide for a table having a saw or the like comprising in combination:

clamping means connecting said guide to a fence on the saw table,

and means for vertically elevating from one horizontal elevation to another said guide relative to the table whereby a workpiece can operatively engage an edge of said guide and said guide can be vertically reoriented to accommodate diverse workpieces, and including hinge means be-

tween said guide and said clamping means, whereby said guide can be rotated in an arc about said hinge means into an inoperative position,

wherein said vertically elevating means comprises,

a bracket attached to said hinge means,

a threaded rod supported in said bracket, and

a support bar fastened on said guide and threaded to said threaded rod,

whereby rotation of said threaded rod vertically moves said support bar and therefore said guide from one horizontal elevation to another.

4,431,847

CIRCUIT ARRANGEMENT FOR AN ADJUSTING DRIVE FOR A PRESS RAM ADJUSTMENT

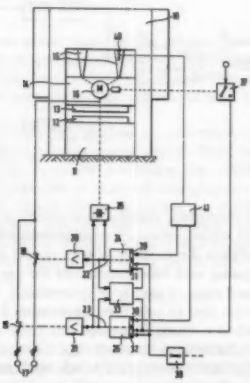
Franz Schneider, Göppingen; Ewald Bergmann, Rechberghausen, and Gerhard Gering, Süssen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Göppingen, Fed. Rep. of Germany

Division of Ser. No. 62,579, Aug. 1, 1979, Pat. No. 4,378,717. This application Apr. 15, 1982, Ser. No. 368,588

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833829

Int. Cl.³ B26D *7/26*; B30B *15/14*

U.S. Cl. 83—530 **6 Claims**



1. In a high-speed cutting press comprising a press ram, a platen, an upper die means attached to the press ram, a lower die means attached to the platen, the upper die means being adapted to penetrate into the lower die means during a cutting operation, and drive means for driving the press ram to adjust the position thereof, the improvement comprising a control arrangement for the adjusting drive of the press ram comprising means for actuating the drive means, switching means for controlling the connection between the drive means and the actuating means so that said drive means may be actuated in either a direction to raise the press ram or a direction to lower the press ram, and means for maintaining a depth of penetration of the upper die means into the lower die means at a constant value during operation of the high-speed cutting press in dependence upon an operating condition of the high-speed cutting press, the maintaining means includes a force measuring sensor means, a circuit means receiving signals from the force measuring sensor means for evaluating the received signals and providing an output signal upon the occurrence of a predetermined output signal from the force measuring sensor means, and oscillator means connected to said evaluator circuit means and the drive means for actuating the drive means in a direction so as to one of raise and lower the press ram in response to a predetermined force sensed by the force measuring sensor means.

4,481,848

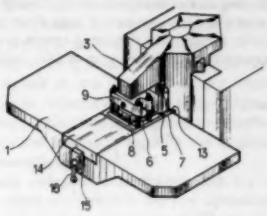
CORNER SHEAR MACHINE

Chihiro Ikeda, Tatsukuchi, Japan, assignor to Takeda Machinery Works Company, Ltd., Japan

Filed Jun. 7, 1982, Ser. No. 386,085

Int. Cl.³ B26D *3/14*

U.S. Cl. 83—693 **8 Claims**



1. A corner shearing machine for cutting off a notch, slot or the like having a V-shaped, square or rectangular configuration at a corner or side of a workpiece in the form of a sheet material, said corner shearing machine comprising:

a reciprocal ram;

a table defining a recessed channel extending toward said ram across the table and a square opening defined in a bottom surface of said recessed channel, said ram and said table being separated from one another to define a space therebetween; and

a modular tool assembly unit removably mounted in said recessed channel in said space between said ram and said table and in a position located above said square opening, said modular tool assembly unit including a punch block having a punch fixed thereto, a die block defining a die cavity, mounting means for mounting said punch and die blocks in opposing separated relationship to one another and for permitting said punch block to be reciprocally vertically displaced relative to said die block in response to reciprocation of said ram, said punch being displaceable between a displaced position and a punch position wherein said workpiece is sheared, and biasing means for biasing said punch block in a direction towards said displaced position tending to separate said punch and die blocks, and wherein said modular tool assembly unit is integrally removable from said corner shearing machine so as to permit replacement thereof by another modular tool assembly unit.

4,481,849

HORIZONTAL BANDSAW MACHINE

Minoru Aoyagi, Hatano, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Sep. 28, 1981, Ser. No. 306,505

Claims priority, application Japan, Sep. 29, 1980, 55-134238; May 12, 1981, 56-70152

Int. Cl.³ B27B *13/04*

U.S. Cl. 83—796 **5 Claims**

1. An apparatus for controlling the raising and lowering of a cutting head assembly of a horizontal bandsaw machine having a cutting head assembly carrying a bandsaw blade with a cutting edge, said apparatus comprising:

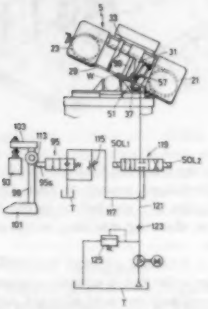
(a) sensing means for sensing the top surface of a workpiece to be cut;

(b) actuating means, operatively coupled to said sensing means, said actuating means switching from a first state to a second state when said sensing means senses the top surface of a workpiece;

(c) carrier means, operatively coupled to said actuating means, wherein the position of said carrier means is moveable with respect to the cutting edge of the blade of the bandsaw when the actuating means is in the first state and

the position of said carrier means is fixed with respect to the cutting edge of the blade of the bandsaw when the actuating means is in the second state, wherein the fixed position of said carrier means is adjusted in relation to the top surface of the workpiece when said actuating means is in said first state; and

(d) detecting means, mounted on said cutting head assembly for movement therewith such that said detecting means contacts said carrier means upon the raising of said cutting head, wherein upon contact of said detecting means and said carrier means, said detecting means provides a signal for stopping the further raising of said cutting head;



wherein said carrier means comprises:

(i) an elongated rod member fixed mounted on said cutting head assembly;

(ii) a dog carrier moveably mounted on said elongated rod member, wherein said dog carrier includes a clamping means coupled to actuating means for contacting and fixedly clamping said dog carrier to said elongated guide rod when said actuating means is in the second state; and

(iii) dog means mounted on said dog carrier, wherein said detecting means contacts said dog means upon the raising of said cutting head.

4,481,850

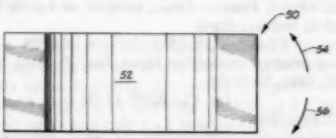
SCORED REVERSE BUCKLING RUPTURE DISK APPARATUS

Jerome D. Allen, Tulsa, Okla., assignor to BS&B Safety Systems, Inc., Tulsa, Okla.

Division of Ser. No. 330,809, Dec. 15, 1981, Pat. No. 4,441,350. This application Jan. 16, 1984, Ser. No. 570,755

Int. Cl.³ B26D *3/08*

U.S. Cl. 83—879 **6 Claims**



1. Apparatus for forming scores of a known depth on a surface of the concave-convex dome portion of a rupture disk, said scores radiating outwardly and having a known depth variance from the central portion of said concave-convex dome portion of said disk towards the periphery thereof comprising:

a score blade having a convex curved leading edge for forming one or more scores on the concave side of said concave-convex dome portion of said disk;

a score anvil having a curved recess formed therein for receiving the convex side of said concave-convex dome portion of said disk and positioned facing the leading edge of said score blade, said curved recess being of a configuration such that curved surfaces are provided thereon having radii of curvature equal to and greater than the radius of curvature of said leading edge of said score blade;

means for selectively bringing said curved leading edge of said score blade into forcible contact with said surfaces of said curved recess in said score anvil attached to said score blade and to said anvil; and

means for selectively moving said score anvil relative to said score blade whereby the radius of curvature of the curved surface of said recess contacted by said leading edge of said score blade can be selectively increased or decreased.

4,481,851

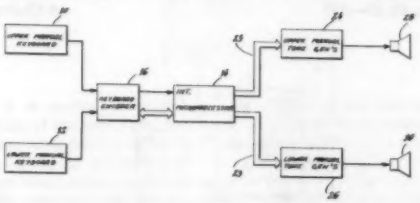
TONE GENERATOR ASSIGNMENT SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Richard S. Swain, Niles, and Mark Fimoff, Hoffman Estates, both of Ill., assignors to Norlin Industries, Inc., White Plains, N.Y.

Filed Jun. 22, 1981, Ser. No. 275,723

Int. Cl.³ G10H *1/18*

U.S. Cl. 84—1.01 **12 Claims**



9. In a keyboard electronic musical instrument of the type having a plurality of multi-frequency tone generators substantially less in number than the number of keys of said keyboard, the method of assigning said tone generators for operation in response to depressed ones of said keys comprising:

assigning a different one of said tone generators for operation in response to a newly depressed key until all of said tone generators have been so assigned;

identify the tone generators assigned to released ones of said keys in a time ordered sequence; and

re-assigning the tone generator assigned to the oldest released key identified by said time ordered sequence for operation in response to a subsequently depressed key.

4,481,852

SOUND GENERATING CIRCUIT FOR TIMEPIECE

Shunichi Makuta; Hiroshi Miyasaka, both of Kitakatsushika, and Katsuhiko Takebe, Machida, all of Japan, assignors to Rhythm Watch Company Limited, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,291

Claims priority, application Japan, Jul. 10, 1980, 55-94775; Jul. 31, 1980, 55-105249; Aug. 1, 1980, 55-106530; Aug. 1, 1980, 55-106531

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **9 Claims**

1. A sound generating circuit for a timepiece comprising:

a sound base signal generator which feeds out sound base signals having a certain frequency;

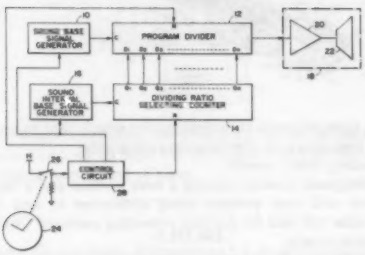
a programmable divider with a plurality of different selectable dividing ratios, and which divides said sound base signals at a desired dividing ratio to output sound signals, said divider being responsive to a dividing ratio selecting counter;

a sound interval generator which feeds out first sound interval base signals and second sound interval base signals;

said dividing ratio selecting counter being composed of:

a repeating cycle counter which repeatedly counts said second sound interval base signals in order to determine the maximum dividing ratio of said programmable divider in accordance with the count value of the repeating cycle counter; and

a programmable counter which determines the dividing ratio of said programmable divider from maximum to minimum, and determines sound intervals by means of counting the first sound interval base signals, said maximum dividing ratio is determined by presetting the count value of said repeating cycle counter, and said minimum dividing ratio is determined by the instantaneous count value of the programmable counter when said programmable counter is counted up; and



a sound producer which drives sounding elements in accordance with the sound signals of said programmable divider;

whereby sounding action is performed by decreasing the frequency of said sound signals from maximum to minimum by means of increasing the dividing ratio of said programmable divider and changing the frequency of said sound signals from minimum to maximum when said frequency reaches minimum frequency by means of changing the dividing ratio of said programmable divider, said sounding action being performed cyclically and repeatedly.

4,481,853

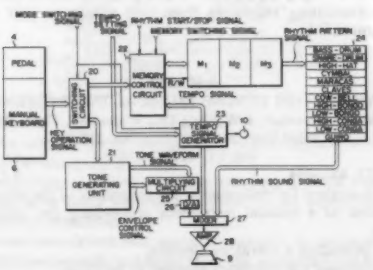
ELECTRONIC KEYBOARD MUSICAL INSTRUMENT CAPABLE OF INPUTTING RHYTHMIC PATTERNS

Tomohisa Ishikawa, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 190,608, Sep. 25, 1980, abandoned. This application Jul. 9, 1982, Ser. No. 396,780

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **13 Claims**



1. An electronic keyboard musical instrument including a keyboard having a plurality of keys each of which respectively coresponds to a different musical pitch, and a musical tone generating means coupled to said keyboard for generating musical tones in response to the operation of said keys of said keyboard, comprising:

changeover switching means coupled to said keyboard for changing over between a performance mode of operation of said keys of said keyboard for outputting musical tones from said musical tone generating means using the keys of said keyboard for specifying the pitches of the musical tones of at least one of a melody and an accompaniment of a musical piece, and a setting mode of operation of said keys of said keyboard for setting a percussive rhythmic pattern using said keys of said keyboard;

tempo signals generating means including means for generating tempo signals in real time and at user selectable timings, and means responsive to said tempo signals for providing a tempo indication perceptible to a performer, said tempo indication at least indicating the beginning of respective measures of music;

memory means coupled to said keyboard for storing as percussive rhythmic patterns the key operation patterns which are obtained by operating said keys of said keyboard in real time and in time with said tempo signals from said tempo signals generating means when said changeover switching means is in said setting mode of operation to thereby store said percussive rhythmic patterns in said memory means in real time;

percussive sound generating means coupled to said memory means for generating percussive sounds with timings in actual musical time according to said percussive rhythmic patterns stored in said memory means; and

at least some of said keys of said keyboard being for specifying kinds of percussive sounds, and at least one of said keys being for inputting information corresponding to the output rhythmic timing of percussive sounds when said changeover switching means is changed over to said setting mode of operation; and

at least some of the keys of said keyboard setting said rhythmic patterns when said changeover switching means is changed over to said setting mode of operation.

4,481,854

CONTROL FOR MUSICAL INSTRUMENTS

Paul Dugas, Quebec, Canada, assignor to JAM Ind., Ltd., Canada

Filed Dec. 20, 1982, Ser. No. 451,009

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.19 **8 Claims**

1. An electrical stringed and fretted musical instrument; comprising:

a first pick-up means and a second pick-up means;

a first potentiometer having a first end, a second end and a slider arm disposed between said first and second ends;

said first pick-up means being connected to said first end of the first potentiometer and said second pick-up means being connected to said second end of the first potentiometer;

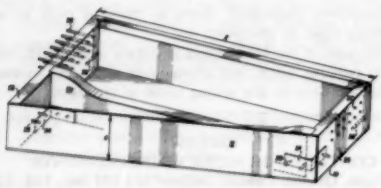
a high pass filter means having an input terminal and an output terminal;
a low pass filter means having an input terminal and an output terminal;
said slider arm of the first potentiometer being connected in parallel to both said low pass filter means input terminal and high pass filter means input terminal;
a second potentiometer having a first end, a second end, and a slider arm disposed between said first and second ends;
the output terminal of said high pass filter means being connected to said first end of said second potentiometer;
the output terminal of said low pass filter means being connected to the second end of said second potentiometer;
output means;
the slider arm of said second potentiometer being connected to said output means;
wherein, said first and second potentiometers are controlled by a 2-axis joystick means whereby to simultaneously combine the outputs of said first pick-up means, said second pick-up means, said high pass filter means and said low pass filter means at said output means.

4,481,855

ZITHER-LIKE INSTRUMENTS

Richard E. Bozung, Rte. 1 Box 286, Mt. Pleasant, S.C. 29464

Filed Mar. 9, 1982, Ser. No. 356,392
Int. Cl.³ G10D *1/12, 3/02;* G10G *5/00*
U.S. Cl. 84—173 **9 Claims**



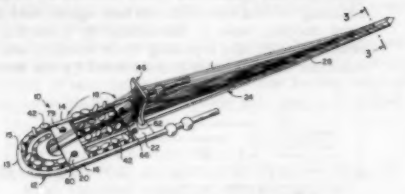
1. A zither-like musical instrument for producing a mellow, guitar-like sound comprising:
a sound box body comprising first, second, third and fourth side members and a backboard;
a sound board fitted over and secured to said first, second, third and fourth side members of said sound box body;
a plurality of strings extending over said sound board in a longitudinal direction;
said first side member comprising a first pin block further comprising means for securing one end of each string to said first pin block;
said second side member comprising a second pin block further comprising means for securing the other end of each string to said second pin block;
said third side member of said sound box body comprising a thin construction for freely vibrating with said sound board;
said fourth side member of said sound box body comprising a thick construction for providing structural support to said sound box body;
a support member contained within said sound box body, being secured to said first and second side members and said backboard, and being cut away at one edge to allow the sound board to vibrate freely;
a movable bridge; and
indicia on said sound board designating different positions to which said movable bridge can be moved to change the musical key in which said strings are tuned.

4,481,856

STRINGED INSTRUMENT FOR ATTACHMENT TO AN ELECTRONIC TRANSDUCER

Robert S. Grawi, 655 6th Ave., Rm. 215, New York, N.Y. 10010

Filed Sep. 7, 1982, Ser. No. 415,589
Int. Cl.³ G10D *1/08, 3/04*
U.S. Cl. 84—173 **4 Claims**



1. A stringed musical instrument for attachment to an electronic transducer, in combination comprising:
mounting frame means;
an elongated member having a near portion and a far portion, said near portion being connected to said frame means and said far portion extending outward from said frame means;
string holding means mounted to said frame means;
upright bridge means mounted to said frame means between said far portion and said holding means;
means connected to said bridge means for mounting an electronic transducer means and passing vibrations received by said bridge means to said transducer;
one end of said strings being connected along said far portion of said elongated member at predetermined intervals, said bridge means being for receiving and positioning said strings at predetermined positions and passing vibrations from said strings to said transducer and said holding means being for holding the other end of said strings and for tuning said strings, whereby when the strings are plucked, the resulting vibration passes directly to the transducer so that the sound can be passed directly to amplifying equipment and speakers; wherien said mounting frame means is a U-shaped member having parallel arms and cross-member means connected to said arms, said near portion of said elongated member being connected to the center of said cross-member means and extending parallel to said arms in the open end of said U-shaped member; and wherein said bridge means is a bridge mounted on the top side of said cross-member means and body, having a configured aperture provided with a plurality of string gripping means around the inner perimeter of said aperture, said strings being connected to said string-gripping means, said gripping means being for transmitting vibrations from said strings to said transducer.

4,481,857

SYSTEM FOR TUNING MUSICAL INSTRUMENTS

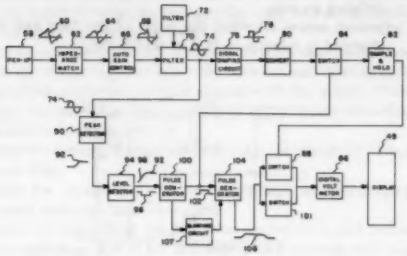
Richard D. Havener, 4 Whaling Dr., Waterford, Conn. 06385

Filed Dec. 29, 1980, Ser. No. 220,811
Int. Cl.³ G10G *7/02*
U.S. Cl. 84—454 **8 Claims**

1. A method for determining the frequency of the vibratory elements of a musical instrument comprising the following steps:
(a) providing a vibratory element;
(b) causing the vibratory element to oscillate;
(c) obtaining as an input the oscillations from the vibratory element and converting the input into an electrical signal;
(d) deriving and providing as an output those portions of the electrical signal which are present within a generally narrow predetermined frequency range;

(e) monitoring the output from step (d) for a first predetermined period of time;

(f) eliminating any further input from step (d) for a second predetermined period of time at the conclusion of the first period of time; and



(g) visually displaying the frequency of the oscillations of the vibratory element for no longer than the second predetermined period of time.

4,481,858

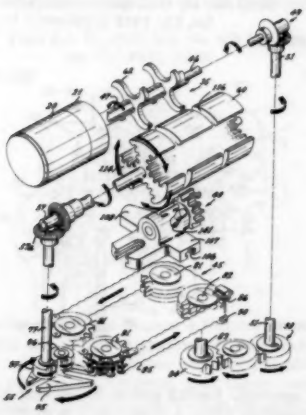
SINGLE BARREL EXTERNALLY POWERED GUN

Leonard W. Price, Marina Del Rey, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.

Division of Ser. No. 303,705, Sep. 18, 1981, Pat. No. 4,418,607, which is a continuation of Ser. No. 789,502, Apr. 21, 1977, abandoned, which is a continuation of Ser. No. 418,356, Nov. 23, 1973, abandoned. This application Mar. 28, 1983, Ser. No. 479,659

Int. Cl.³ F41D *5/00, 10/06*

U.S. Cl. 89—11 **47 Claims**



1. An externally powered gun mechanism capable of a high rate of fire comprising

a supporting receiver structure carrying at least one gun barrel in fixed stationary relation to the supporting receiver structure,

at least one driven bolt assembly movable in reciprocating motion towards and away from the associated gun barrel,

at least one drive chain drive assembly mounted on said supporting structure and continuously operating during a firing cycle to advance the cooperating bolt assembly through a cycle of feeding, ramming, firing, extracting, and ejecting,

a driven feeder assembly cooperating to feed rounds to said bolt assembly and for ejecting the spent casing,

means forming a power transmission system for driving said chain drive assembly and for driving said feeder assembly in synchronism with said chain drive assembly;

said chain drive assembly including means carried thereby and driven along a predetermined path of travel which includes portions defining the timing and sequence of the cycle of feeding, ramming, firing, extracting and ejecting; and

said means which are driven along said predetermined path being in engagement with said bolt assembly during travel along said predetermined path and being operative to effect reciprocation of said bolt assembly.

4,481,859

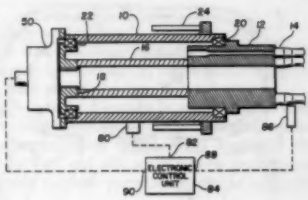
GATLING GUN CONTROL SYSTEM

Joseph Dix, Williston, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Mar. 9, 1983, Ser. No. 473,419

Int. Cl.³ F41D *7/00*

U.S. Cl. 89—12 **5 Claims**



1. In a Gatling gun system having:

a stationary housing;

a rotor assembly, journaled for rotation about a longitudinal axis within said housing, having

a plurality of gun barrels with respective chambers disposed in an annular row about said longitudinal axis,

a like plurality of gun bolts, each aligned with a respective gun barrel,

a fire cam for causing each gun bolt to fire a round in its respective aligned chamber at a particular angular displacement during the rotation of said rotor assembly;

the improvement of:

normally inactive brake means coupled to and between said housing and said rotor assembly;

means to activate said brake means to rapidly halt the rotation of said rotor assembly relative to said housing;

first means to provide a first signal upon the passage of each gun bolt past said particular angular displacement;

second means to provide a second signal upon the commencement of recoil of said rotor assembly; and

control means for receiving said first and second signals and for providing a brake operate signal to said means to activate said brake means if said first signal is not followed by a second signal within a predetermined period of time.

4,481,860

CARTRIDGE MAGAZINE FOR CANNON MOUNTED IN TANK TURRETS, ESPECIALLY ARMORED CAR TURRETS

August Schiele, and Wolfgang Huber, both of Augsburg, Fed. Rep. of Germany, assignors to Firma Keller and Knappich Wehrtechnik GmbH, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,996

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031202

Int. Cl.³ F41F *9/06*

U.S. Cl. 89—34 **3 Claims**

1. A cartridge magazine for the cannon of an armored vehi-

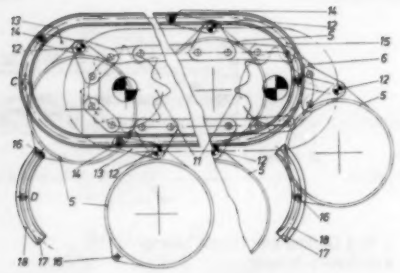
cle turret, the cannon having a bore axis and a "zero" elevation position, the cartridge magazine comprising:

a plurality of tubular cartridge containers having axes which are parallel to each other and parallel to the bore axis of the cannon, with the cannon in the "zero" elevation position, said plurality of cartridge containers moving in an endless patten having two superimposed parallel planes, one plane extending across the bore axis with the cannon in the "zero" elevation position;

a first endless conveyor chain having a first plurality of trunnions each connected to one of said containers at one end of each container for moving said containers in said endless pattern;

a second endless conveyor chain having a second plurality of trunnions each connected to one of said containers at an opposite end of each container for moving said containers in said endless pattern;

drive means connected to said first and second endless conveyor chains for driving said first and second endless conveyor chains to move said plurality of containers in said endless pattern;



at least one endless guide rail disposed at a location spaced from the path of movement of each of said first and second plurality of trunnions;

a first pilot connected to each container adjacent one end thereof and at a first spaced location from each of said first plurality of trunnions, each of said first pilots riding in said guide rail;

a second pilot connected to each of said containers at said one end thereof at a second spaced location from each of said first plurality of trunnions which is greater than said first spaced location;

said guide rail having a pair of opposite end deflection areas at which containers move from one of said horizontal planes to the other; and

a secondary open guide rail adjacent each of said end deflection areas for receiving each of said second pilots in succession as a container carrying each second pilot moves past one of said deflection areas, each secondary open guide rail having a throat at each end thereof for receiving and discharging each of said second pilots in succession.

4,481,861

FIRE ADJUSTMENT DEVICE DESIGNED TO BE MOUNTED ON THE END OF A GUN BARREL

José Rodriguez, Castelmourou, and Robert Cassanelli, Toulouse, both of France, assignors to Societe Cassanelli & Cie, Balma, France

Filed Jul. 29, 1981, Ser. No. 288,207
Claims priority, application France, Aug. 5, 1980, 80 17273
Int. Cl.³ F41C *21/06*
U.S. Cl. 89—41 A **6 Claims**

1. A fire adjustment device, which comprises:

a gun barrel having a bore,

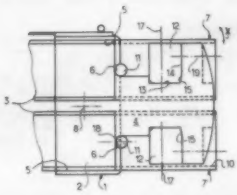
a support frame,

means for mounting said frame at the end of said barrel,

at least one tube pivotally mounted around a pivot means on the frame in proximity to the end of said barrel and being adjustably positioned on said frame in alignment with said barrel by adjustment means,

said tube having a bore similar to that of said barrel and defining an axis,

adjusting means allowing the angle of the tube axis to be changed in relation to that of said barrel,



wherein said support frame includes a base designed to be mounted on said barrel, and two spaced flanges, each flange defining bearing means for functioning as pivot elements of said tube,

wherein said tube further includes a block laterally projecting on each side of said tube, and

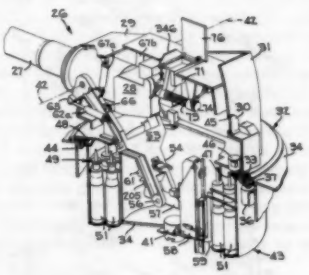
wherein each flange further includes a cut part defining a housing having a wall for accommodating said block laterally projecting from said tube.

4,481,862

AUTOMATIC LOADING SYSTEM FOR FIXED AMMUNITION AT GUN ELEVATION

Roger H. Wiethoff, Wayzata, Minn., and Bruce G. Heron, Morgan Hill, Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 13, 1982, Ser. No. 397,747
Int. Cl.³ F41F *9/04*
U.S. Cl. 89—46 **15 Claims**



1. An automatic loading system for moving large caliber fixed ammunition within a turret which is rotatable about an azimuth axis relative to a turret support structure, wherein a gun barrel is mounted in the turret for movement in elevation relative thereto about an elevation axis, comprising

an ammunition magazine disposed in the turret and rotatable about an axis substantially parallel to the aximuth axis, said magazine being annular in shape and having a plurality of ammunition holding cells therein, said cells being adapted to accommodate and retain fixed ammunition cartridges,

means for angularly indexing said annular magazine to position predetermined ones of said holding cells at a load position,

a loader arm pivotally attached to the turret at one end,

a ram tray assembly pivotally mounted on the other end of

said loader arm and being adapted to receive, engage and disengage fixed ammunition cartridges,

means positioned on said loader arm for translating and rotating said ram tray assembly between said load position, wherein an ammunition cartridge may be moved between a holding cell and said tray, and an intermediate tray position, wherein the cartridge long axis substantially intersects the elevation axis,

means positioned on said turret for rotating said loader arm to move said ram tray assembly between said intermediate position and a ram position aligned with the breech of the gun barrel when the barrel is at an arbitrary elevation relative to the turret,

means for moving ammunition cartridges into and out of said ram tray,

means for receiving from the breech and for discharging spent cartridge stub cases, and

means for controlling the actuation sequence of said means for indexing, means for translating and rotating said ram tray, means for rotating said loader arm, means for moving ammunition cartridges, and means for receiving and discharging spent stub cases to operate the system in a preselected mode.

4,481,863

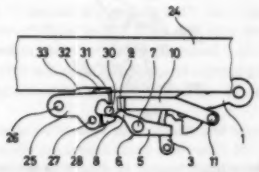
OPERATING LEVER FOR THE BLOCK AND HAMMER OF A SELF-LOADING HAND FIREARM

Georg Zanner, Langenau, and Otto Repa, Oberndorf, both of Fed. Rep. of Germany, assignors to Carl Walther GmbH, Ulm, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,310

Int. Cl.³ F41C *19/00*

U.S. Cl. 89—138 **7 Claims**



1. In a self-loading hand firearm, a hammer pivotable between cocked and uncocked positions, a catch lever which retains said hammer in the cocked position, a slidable block having an open position, retaining lever means cooperating with said block for retaining said block in the open position, operating lever means for releasing said hammer from a cocked position and for releasing said retaining lever means to release said block from its open position, said operating lever means comprising a pair of operating levers each of which is disposed on an opposite side of said firearm such that one of said operating levers is actuated by the thumb of the shooter's hand holding the firearm, means firmly interconnecting said operating levers and a pivotably mounted two-armed lever having first and second arms, one of said operating levers has on its underside an abutment face cooperating with said first arm, said first arm operatively cooperating with said retaining lever means, said second arm operatively cooperating with a catch lever.

4,481,864

HYDRAULIC JACK WITH MECHANICAL SAFETY LOCK

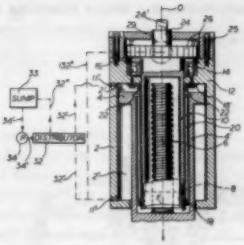
Armando Peruzzi, Rome, Italy, assignor to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed Jul. 20, 1982, Ser. No. 400,159

Claims priority, application Italy, Jul. 21, 1981, 48943 A/81

Int. Cl.³ F15B *15/26*

U.S. Cl. 91—44 **9 Claims**



1. A hydraulic jack comprising:

a cylinder with first and second ports at opposite ends thereof selectively connectable by a distributor to a source of hydraulic fluid under pressure;

a hollow piston coaxially disposed in said cylinder with a piston head located between said ports for displacement in a first and a second axial direction by hydraulic fluid admitted to said first and said second port, respectively;

guide means in said cylinder preventing relative rotation of said piston;

a shaft journaled in said cylinder for rotation about the axis thereof;

coupling means connecting said piston with said shaft for translating an axial displacement of said piston into a rotation of said shaft in a sense depending upon the direction of said axial displacement;

a wheel on said shaft having teeth with sloping flanks;

a mobile member urged radially toward said shaft by a strong spring and provided with an extremity forming a guidepath which extends in a direction substantially tangential to the periphery of said wheel in an advanced position of said member;

a pin on said extremity parallel to said shaft and movable along said guidepath between a forward position lying between teeth of said wheel and a rearward position withdrawn from the orbit of said teeth, said pin being urged into said forward position by a weak spring for enabling rotation of said wheel and said shaft against the force of said weak spring in a sense corresponding to said first axial direction while blocking rotation thereof in the opposite sense corresponding to said second axial direction; and 'a hydraulic servomotor provided with a fluid inlet in parallel with said second port for retracting said mobile member from said advanced position against the force of said strong spring to facilitate a displacement of said piston in said second axial direction.

4,481,865

VACUUM BRAKE BOOSTER

Reimund Becht, Frankfurt-Höchst, and Peter Böhm, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,298

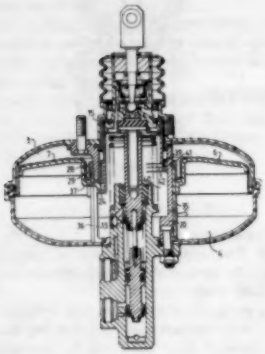
Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918913

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—369 A **6 Claims**

1. A brake booster for a braking system comprising a housing having first and second spaced opposing housing walls, a

movable wall disposed in the housing between said spaced housing walls and dividing said housing into two chambers, axially aligned input and output members, means interconnecting said movable wall to said output member, a control valve assembly operated by said input member for controlling a pressure differential across said movable wall, a tubular memeber extending through the movable wall coaxially with the input and output members and connected to the opposing housing walls, said tubular member having longitudinal slot means disposed between said opposing housing walls with a portion of the interconnecting means extending through the



slot means, said control valve assembly including a tubular valve body and being slidably disposed within said tubular member and generally parallel thereto, and a rolling diaphragm seal disposed between and sealingly engaging said tubular member and said said valve body, said diaphragm having one end affixed to said tubular valve body at the output end of the valve body, a main body portion of said diaphragm extending between the tubular body and the tubular member and generally parallel thereto, and the opposite end of said diaphragm affixed to the tubular member adjacent said first housing wall.

4,481,866

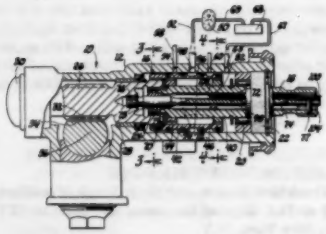
POWER STEERING GEAR WITH VARIABLE RATE TORSION BAR FOR OPTIMIZED STEERING

Michael F. Matouka, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 21, 1983, Ser. No. 544,256

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—375 A **3 Claims**



1. In a vehicle, a power steering gear providing power steering assist effort comprising a housing, an input shaft mounted for turning movement in said housing in response to steering effort by a vehicle operator, output gearing operatively mounted for turning movement in said housing and having output means extending outward from said housing, hydraulic power actuator means operatively mounted in said housing for moving said output means, rotary valve means in said housing operatively connected to a source of pressurized hydraulic fluid for selectively supplying and exhausting pressurized fluid to and from said actuator means to effect the hydraulic power movement of said actuator means and said output means, said valve means comprising a valve body member drivingly connected to said output gearing and a valve spool member connected to said input shelf, lost motion connector means operatively connecting said output gearing to said valve spool member and thereby to said input shaft to permit the vehicle operator to mechanically move said actuator means in said housing, elongated torsion bar means having an outer end portion and an inner end, said torsion bar means extending into said input shaft and operatively connected to said output gearing and to said input shaft to provide a centering spring interconnection between said valve body member and said valve spool member, fixed retainer means for securing said inner end of said torsion bar means to said output gearing and axially shiftable retainer means axially spaced from said retainer means for securing said outer end portion of said torsion bar means to said input shaft at any selected one of a plurality of positions spaced from said innner end of said torsion bar to thereby control the effective torsion bar length and stiffness so that manual steering effort can be variably set between maximum effort at minimum spacing and minimum effort at maximum spacing and operator means extending into said valve spool for moving said shiftable retainer means.

4,481,867

AXIAL PLUNGER PUMP OR MOTOR

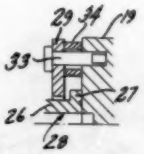
Yukihiko Nagase; Tetsuo Kawasaki, both of Nagoya; Masato Hiromatsu, Tokyo; Sadao Asanabe, and Kunio Saki, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,979

Claims priority, application Japan, Jul. 28, 1981, 56-111004[U]

Int. Cl.³ F01B *13/04*

U.S. Cl. 91—487 **3 Claims**



1. An axial plunger pump or motor in which a valve plate having a suction port and a discharge port drilled therein is fixed to a casing in which a rotary shaft is mounted, a cylinder block having one end surface opposed to said valve plate is coupled to said rotary shaft, a plurality of bores whose one ends can be communicated with said suction port and discharge port are drilled in said cylinder block in parallel to said rotary shaft, a plurality of plungers which can reciprocate within said respective bores in accordance with rotation of said rotary shaft are slidably fitted in said bores on the side of the other ends, and a seal plate positioned between said valve plate and said cylinder block and making slide contact with said valve plate is coupled to said rotary shaft, wherein the improvement comprises:

a plurality of bushings, each including a thin-walled cylinder portion fitted in one end portion of each of said plurality of bores and capable of making tight contact with the inner wall surface of each of the bores when expanded in diameter by a high-pressure liquid within said bores and further including a flange portion butting against said seal plate, interposed between said seal plate and said cylinder block,

an urging plate means for bringing the flange portion of said bush in tight contact with the seal plate in cooperation with the high-pressure liquid, provided between the flange portion of said bush and said one end surface of the cylinder block,

spacers provided in a gap between the seal plate and the urging plate mean-; and

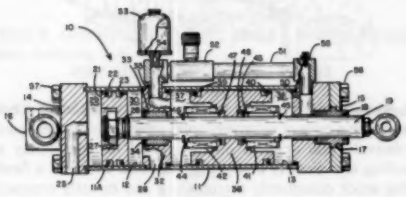
means for preventing the spacers from slipping out of the gap.

4,481,868

FLUID CYLINDER WITH MOTION BUFFERED RAM ASSEMBLY

Lee E. Stump, Brooklyn Park, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Filed Jul. 21, 1983, Ser. No. 515,793
Int. Cl.³ F15B *15/22*
U.S. Cl. 92—9 **7 Claims**



1. Fluid cylinder means comprising a housing with tandemly arranged primary and secondary chambers formed therein, a double-acting ram slidably mounted within said housing and having primary and secondary piston members operatively coupled thereto:

(a) said primary chamber having first and second primary fluid ports communicating therewith for controlling the flow of primary fluid to and from said first chamber, said primary piston member being disposed within said primary chamber and with said first and second primary fluid ports being disposed on opposite sides of said primary piston;

(b) said secondary chamber having first and second secondary fluid ports communicating therewith for controlling the flow of secondary fluid to and from said secondary chamber, said secondary ports being arranged in generally oppositely disposed side ends of said secondary chamber, and with said secondary piston being disposed between said first and second secondary ports, and fluid conduit means directly interconnecting said first and second secondary ports, one to another;

(c) said secondary piston being a single integral member which is resiliently coupled to said ram through a plurality of opposed normally balanced biasing means to permit said secondary piston to move axially relative to said ram and responsive to forces generated in said opposed resilient biasing members while forcing fluid through said fluid conduit means to opposed sides of said secondary piston;

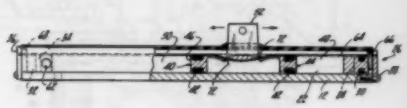
(d) the arrangement being such that when said ram is moved in response to fluid forces within said primary chamber, the rate and extent of the motion of said ram in response to forces induced within said primary chamber is buffered in response to forces generated in said resiliently biased members coupled to said secondary piston within said secondary chamber.

4,481,869

FLUID OPERATED DEVICE WITH IMPROVED SEALING MEANS

Venkat R. Garlapaty, Utica, Mich., assignor to Greenco Corp., Dearborn, Mich.

Filed May 14, 1982, Ser. No. 378,094
Int. Cl.³ F01B *29/08*
U.S. Cl. 92—88 **3 Claims**



1. A fluid operated device comprising:

An elongated housing defining an elongated interior cylinder, said housing having an elongated slot formed along one side and open to said cylinder, and an elongated abutment surface substantially parallel but spaced outwardly from each side of said slot,

a piston longitudinally slidable mounted in said cylinder, said piston forming a first chamber in said cylinder between one end of said housing and one end of said piston and a second chamber in said cylinder between the other end of the housing and the other end of said piston,

means for fluidly sealing said ends of said piston to said cylinder,

means for fluidly sealing said slot along said chambers comprising:

an elongated band constructed of a magnetic material and having a width greater than the width of said slot,

means for securing said band within said cylinder and adjacent said slotted side of said housing so that one side of said band faces and covers said slot,

means for magnetically attracting said band to said one side of said housing and across said slot, said magnetic attracting means comprising a pair of elongated magnets, each magnet having two opposed sides and two opposed edges and,

means for securing said elongated magnets to said housing along opposite sides of said slot so that one edge of each elongated magnet is substantially flush with the inner surface of said cylinder wherein said securing means comprises a pair of elongated magnet retainers, each magnet retainer having an elongated first leg and a substantially perpendicular elongated second leg, means for attaching the first leg of each retainer to one of said magnets so that each magnet is sandwiched in between said first leg of its associated retainer and its associated side of said slot, and means for attaching the second leg of each retainer to said housing comprising a lip formed at the free edge of said second retainer leg which lockingly engages said housing abutment surface, and an elongated resilient wiper secured to the second leg of each magnet retainer said wipers each having an edge which extends over a portion of said slot so that said edges of said wipers are closely adjacent each other.

4,481,870

TRAILER FOR TRANSPORTING LIVING FOWL

G. D. Smith, P. O. Box 188, Fairview, N.C. 28730

Filed Jun. 14, 1982, Ser. No. 378,137
Int. Cl.³ B60H *1/24*
U.S. Cl. 98—6 **6 Claims**

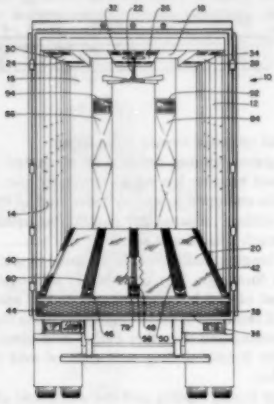
1. An enclosed trailer adapted to transport a plurality of stacked cartons containing living fowl, comprising:

an elongated enclosure defined by a ceiling, a floor, two side walls, a front wall, and a rear opening;

an elongated opening in said floor; said opening running

substantially the entire length of said floor and dividing the floor into approximate equal halves;

an elongated air duct connected to a source of forced air; said air duct being aligned with and located below and adjacent said elongated opening; said air duct running substantially the entire length of said elongated opening; said air duct having a plurality of holes therein pointed upwardly for forcing air along the middle of the length of



the enclosure upwardly from said elongated opening in the floor toward the ceiling;

the cartons adapted to be stacked and arranged in at least two parallel rows along the length of said elongated opening in said floor; means for maintaining a close spacing between the parallel rows of cartons; said duct providing forced air between such parallel rows of cartons whereby the probability of survival of the fowl during transport is increased.

4,481,871

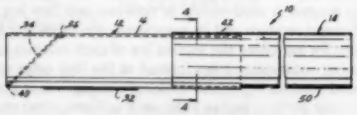
VENTILATOR EXTENSION UNIT

Ernest Efstratis, 6775 Wing Lake Rd., Birmingham, Mich. 48010

Filed Jul. 29, 1982, Ser. No. 402,958

Int. Cl.³ F24F *13/06*

U.S. Cl. 98—40 C **5 Claims**



1. A portable air duct extension unit especially for use in a building heated or cooled by forced air and having a hot or cold air outlet, comprising a mounting section and an extension section, each section comprising an elongated channel-shaped extrusion of uniform cross-section throughout its length having a front wall and laterally spaced side walls, each extrusion being open at both ends and open from end to end along the rear thereof between said side walls, said extrusions being slidably telescoped together to permit the length of said unit to be varied, means for removably mounting said mounting section over an air outlet in the wall of a building with the rear thereof disposed close to said wall, a closure plate secured to the end of the extrusion of said mounting section opposite the telescoped end thereof, one of said extrusions having slots receiving the side walls of the other extrusion, and rib and groove means for slidably retaining the side walls of said other extrusion in said slots.

4,481,872

APPARATUS FOR MAKING A FAB COATED MEAT PRODUCT

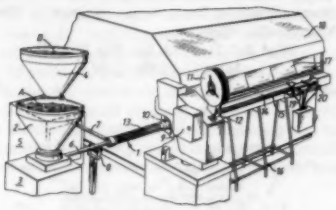
Bernard T. Matthews, Norwich; Alan J. Benstead, Aylesham; David J. Joll, Reepham; Sidney Thorp, Morley, and David N. Wilson, Hellesdon, all of England, assignors to Bernard Matthews Limited, Norfolk, England

Division of Ser. No. 162,241, Jun. 23, 1980, Pat. No. 4,407,830. This application Apr. 4, 1983, Ser. No. 481,883

Claims priority, application United Kingdom, Jun. 28, 1979, 7922452

Int. Cl.³ A22C *11/00*

U.S. Cl. 99—353 **7 Claims**



1. Apparatus for making a meat product, said meat product comprising a core of relatively solid intact natural meat pieces, a relatively thin uniform outer layer of fat completely surrounding and directly contacting the meat core and a flexible casing stock completely surrounding and directly contacting the fat layer within which fat layer and casing stock the meat product is cooked, said apparatus comprising:

an extrusion mandrel to be fed under pressure with relatively solid intact natural meat pieces from a first container and with relatively fluid fatty material from a second container;

an end forming and securing device; and

a track for receiving an elongate extruded and cased billet extruded from the mandrel;

said extrusion mandrel comprising an unobstructed central passage and a separate surrounding annular passage, the exterior of said extrusion mandrel being adapted for storing flexible casing stock, said extrusion mandrel further comprising a laterally enlarged extrusion head located at the outlet end of the extrusion mandrel, said extrusion head having an annular extrusion orifice for the fatty material which is narrower than the annular passage in the extrusion mandrel behind the extrusion head, and a central extrusion orifice for the core which is of increased cross-sectional area relative to the central passage in the extrusion mandrel behind the extrusion head.

4,481,873

DEEP FAT FRYER WITH EXTENDED HEAT TRANSFER TUBES

Richard T. Keating, 144 N. Cuyler, Oak Park, Ill. 60302

Filed May 11, 1983, Ser. No. 493,432

Int. Cl.³ A47J *37/12*

U.S. Cl. 99—403 **5 Claims**

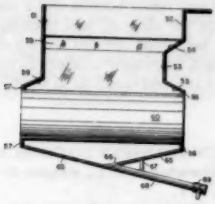
1. A deep fat fryer, comprising:

a cooking vessel formed by continuous, permanent wall means comprising a front wall, a rear wall and two side walls for containing fat and defining an upper cooking section and a lower heat exchange section;

heat exchange means disposed in said lower heat exchange section;

means for supporting food in said upper cooking section above said heat exchange means;

the cross-sectional dimensions of said upper cooking section defining the surface area of said fat exposed to atmosphere; and



the cross-sectional dimensions of said lower heat exchange section surrounding said heat exchange means being significantly larger than the cross-sectional dimensions of said upper cooking section.

4,481,874

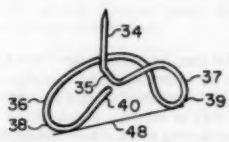
WIRE MEAT SUPPORT

Edward T. Greck, Amherst, N.Y., assignor to Neat Products, Inc., Amherst, N.Y.

Filed May 6, 1983, Ser. No. 492,385

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—419 **16 Claims**



1. A support for a meat portion to be cooked which comprises a wire base support section, an intermediate section and prong means attached thereto, said base support section comprising a one-piece wire portion bent into a support having rounded end portions adapted to contact and rest on the bottom surface of a cooking vessel, said intermediate portion at a substantially higher elevation than said rounded end portions and having a meat support surface on both sides adjacent said prong means and wherein said base support section is constructed in such a manner to permit said support to fall on its side when not in use.

4,481,875

BULB PEELING APPARATUS

Kaku Toyosato, Yokohama, Japan, assignor to M.G.I. Co., Ltd., Kanagawa, Japan

Filed Dec. 3, 1982, Ser. No. 446,571

Int. Cl.³ A23N *7/00, 15/08*

U.S. Cl. 99—584 **10 Claims**

1. A bulb peeling apparatus for peeling skins off bulbs, comprising:

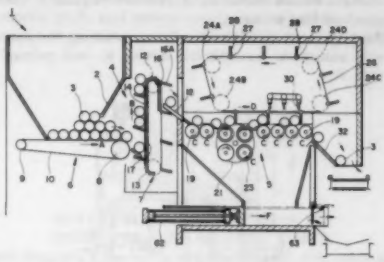
means for conveying bulbs along a predetermined path at a variable speed;

means for setting said variable speed;

means for rotating the bulbs as they are conveyed along said path;

means for inscribing grooves on the outer peripheries of the bulbs, said inscribing means also causing the bulbs to be rotated when in contact therewith;

means for directing jets of air onto the grooved bulbs, such that the skins of the bulbs are peeled off; and



means disposed near said predetermined path, including said inscribing means, and engageable with the bulbs for loosely regulating the positioning and the speed of the bulbs on said conveying means.

4,481,876

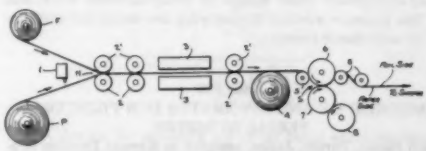
TREATMENT OF FOIL LAMINATED PAPERBOARD

Angel Amendola, Cedar Grove, N.J., assignor to Alford Industries Inc., Ridgefield Park, N.J.

Filed Nov. 18, 1982, Ser. No. 442,821

Int. Cl.³ B30B *15/34*

U.S. Cl. 100—38 **5 Claims**



1. A process for smoothing a foil laminated paperboard which comprises, passing a foil laminated paperboard through a smoothing nip formed by a heated polished hard surface roller and an elastomer covered resilient roller with the foil surface against the polished roller at a nip pressure maintained to smooth the surfaces of the paperboard, the adhesive used to laminate the foil to the paperboard being melted by the heat transmitted by the hard roller and most of the adhesive caused to flow-into the valleys on the surface of the paperboard.

4,481,877

AUTOMATIC TRANSMISSION FOR FOUR WHEEL DRIVE AUTOMOTIVE VEHICLES

Toshio Takano, Hamuramachi, and Toshio Kobayashi, Koganei, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1980, Ser. No. 171,769

Claims priority, application Japan, Sep. 13, 1979, 54-117725; Sep. 13, 1979, 54-117726; Sep. 13, 1979, 54-117727

Int. Cl.³ B60K *41/02;* F16D *43/22*

U.S. Cl. 180—233 **9 Claims**

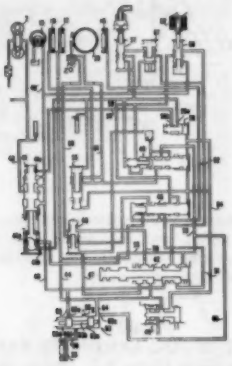
1. An automatic transmission for an automotive vehicle having an engine and a pair of front wheels and a pair of rear wheels, comprising

a torque converter connected to a crank shaft of the engine of said automotive vehicle,

an automatic transmission connected to a turbine shaft of said torque converter, said automatic transmission having a planetary gear, a plurality of fluid operated means for producing various operational ranges, and means including a final reduction gear for transmitting an output of said automatic transmission to the pair of front wheels,

a pressure oil control means for operating said fluid operated means in said automatic transmission, said pressure oil control means including a pressure regulator valve to produce line pressure,

a fluid operated clutch means for transmitting the output of said automatic transmission device to said pair of rear wheels,



a changeover valve means for operatively connecting the line pressure to said fluid operated clutch means,

said pressure oil control means for raising said line pressure with increase of load of the engine, and

said changeover valve means for being actuated when said line pressure is raised for applying the raised line pressure to said clutch means.

4,481,878

METHOD OF AND APPARATUS FOR PRINTING SERIAL NUMBERS

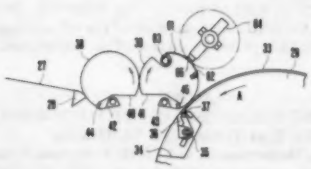
Toshio Hoshi, Toride, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1983, Ser. No. 476,223

Claims priority, application Japan, Mar. 24, 1982, 57-47691

Int. Cl.³ B31F *1/07*; B44B *5/00*

U.S. Cl. 101—23 **3 Claims**



1. An apparatus for printing an image pattern and a serial number on a sheet, comprising:

(a) a transfer cylinder for transferring the sheet in a running direction, said transfer cylinder having a first resilient member covering at least a portion of a peripheral surface thereof;

(b) an impression cylinder disposed in rolling contact with said transfer cylinder downstream of said transfer cylinder with respect to said running direction and having a second resilient member covering a peripheral surface thereof;

(c) a printing cylinder disposed in rolling contact with said impression cylinder for printing an image pattern on the sheet which is transferred from said transfer cylinder to said impression cylinder and held against the latter;

(d) a numbering device for pressing the sheet against said first resilient member to form an ink-free raised portion on the sheet in a character pattern indicative of the serial number; and

(e) an ink applying device for applying an ink image pattern to said printing cylinder and a film of ink at a position thereon aligned with said raised portion on the sheet as it is placed on said impression cylinder, said film of ink being transferred to said raised portion and a plane image pattern printed on the sheet by said printing cylinder in a single pass of said sheet through the nip of said printing cylinder and said impression cylinder to produce both an ink pattern and an inked raised serial number on said sheet.

4,481,879

NON-SLIP DESIGN TRANSFER TO CONICAL ARTICLES

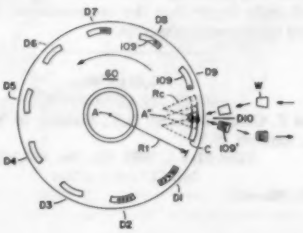
William E. Lock, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 332,722, Dec. 21, 1981, Pat. No. 4,440,589.

This application Sep. 29, 1982, Ser. No. 427,512

Int. Cl.³ B41F *17/28*

U.S. Cl. 101—39 **23 Claims**



1. Apparatus for transferring a design from a first surface to a second surface by intimate rolling non-slip contact of said surfaces along a line in contact shared therebetween comprising:

said first surface having a first center and a selected radius of curvature extending therefrom which is colinear with the line of contact,

means for carrying the first of said surfaces about a second fixed center of rotation which is offset from said first center,

means for rotatably carrying the second surface about an axis of rotation,

said second surface having a surface ray lying thereon defining a line including the line of contact,

said line intersecting the axis of rotation at a point corresponding to an apex of said second surface,

and means for orienting one surface relative to the other, such that when said surfaces are engaged, the ray of said second surface along the line of contact between the surfaces is colinear with the radius of curvature of the first surface, and said radius of curvature has a center coincident with the apex of the second surface.

4,481,880

DOT PRINTER

Makoto Kurosawa; Hiroshige Nakano; Kensei Hosoya, and Tsuneki Kobayashi, all of Ibaraki, Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan

Continuation of Ser. No. 291,719, Aug. 10, 1981, abandoned.

This application Apr. 19, 1983, Ser. No. 484,693

Claims priority, application Japan, Oct. 6, 1980, 55-140197

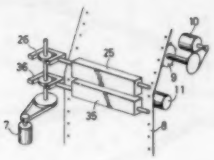
Int. Cl.³ B41J *3/12*

U.S. Cl. 101—93.04 **2 Claims**

1. A dot printer comprising:

first and second hammer banks, each of said hammer banks comprising a plurality of printing hammers arranged in a dot printing direction at predetermined intervals, a plural-

ity of dot printing elements, each of said dot printing elements being mounted on a tip of a corresponding one of said printing hammers, said dot printing elements of each of said hammer banks being arranged in a line parallel to a dot printing direction and perpendicular to a printing sheet feeding direction and extending along most of a width of a printing area of a printing sheet, said tips of said printing hammers of said first hammer bank being at a lower end of said printing hammers of said first hammer bank, said tips of said printing hammers of said second hammer bank being at an upper end of said printing hammers of said second hammer bank, and said first and sec-



ond hammer banks being spaced a predetermined distance apart from one another in said printing sheet feeding direction such that said lines of said dot printing elements of said first and second hammer banks are spaced apart from one another by a distance less than a character format height; and

driving means for reciprocating said two hammer banks oppositely in said dot printing direction through distances substantially less than lengths of said hammer banks in said printing direction to cause said dot printing elements of said first and second hammer banks to simultaneously print characters in a single line.

4,481,881

HOT MELT SCREEN PRINTING MACHINE

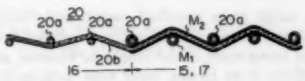
Tadao Okano, Toride, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Division of Ser. No. 154,134, May 29, 1980, Pat. No. 4,398,462. This application May 16, 1983, Ser. No. 495,106

Claims priority, application Japan, May 30, 1979, 54-67183; Sep. 17, 1979, 54-104605; Dec. 13, 1979, 54-162088

Int. Cl.³ B41F *15/36*

U.S. Cl. 101—126 **5 Claims**



1. A hot melt screen printing machine having a screen plate, said screen plate comprising:

a metalic frame

a screen mesh fixed to said frame, said screen mesh formed from a plurality of insulating material fibers and an electroless, conductive plating layer formed on each of the fibers in first and third regions of said screen mesh, said first and third regions being separated and electrically insulated from each other by a second region, the insulating material fibers of said second region not having a conductive plating layer formed thereon, a resin coating applied onto said mesh on predetermined portions thereof, the portions of said mesh not included in said predetermined portions forming a printing pattern and electrode patterns, at least part of said screen mesh being resistance heated due to the resistance of the screen mesh;

a printing base for mounting an article to be printed and a squeezing means for passing a printing ink from said screen pattern toward said article to be printed, and at least one of said printing base or said squeezing means being provided with heating means; and

power supply means for supplying an electric current to said screen mesh, said power supply means having electrodes coupled to said screen mesh at said electrode patterns thereon.

4,481,882

DEVICE FOR ADJUSTING INK OR MOISTURE-APPLICATION ROLLS

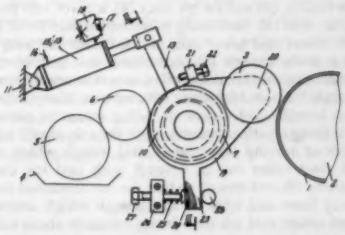
Harald Rudolph, Leipzig, German Democratic Rep., assignor to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jun. 2, 1983, Ser. No. 500,314

Claims priority, application German Democratic Rep., Jun. 2, 1982, 2403864

Int. Cl.³ B41L *31/34, 31/36, 7/40;* **B41K** *25/16*

U.S. Cl. 101—148 **3 Claims**



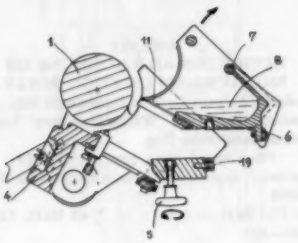
1. A device for adjusting ink or moisture agent application rolls in a printing machine including a printing cylinder and an inking or moisture-applying mechanism which includes a feeding roll for transmitting an ink or moisture to the agent-application rolls, the adjusting device comprising a shaft carrying the feeding roll thereon; and adjusting means each corresponding to a respective agent application roll, each adjusting means including an eccentric mounted on said shaft and having an elongated rod extended radially outwardly from said eccentric; a pneumatic working cylinder having a piston rod, said elongated rod being pivotally connected to said piston rod, said eccentric and said working cylinder adjusting a gap between said feeding roll and said agent application roll upon actuation of the working cylinder, a pivotable double-arm lever having an upper arm and a lower arm and coaxially positioned on said eccentric, said upper arm being connected to the respective agent application roll and being formed with an adjustable stop which comes into contact with said elongated rod upon pivoting of said lever; a setting-screw means including a setting screw located on a wall of said printing machine for coacting with one side of said lower arm, a compression spring positioned between said one side and said setting screw means; and a stationary stop on the other side of said lower arm; said lower arm, upon pivoting of said lever, being movable between said stationary stop and said setting screw; said lower arm contacting said stationary stop during the adjusting of said gap between said respective agent application roll and said feeding roll; said lower arm contacting said setting screw when the force of said spring is overcome and said agent-application roll is adjusted relative to the printing cylinder whereby determined stepwise engagement with and disengagement of the agent application roll from the feeding roll and the printing cylinder are effected.

4,481,883

LOW-BLADE INKING MECHANISM WITH DETACHABLE INK DUCT TROUGHS

Bernard Savart, Saint-Maur, and Alain Ducournau, Basse Goulaine, both of France, assignors to Creusot-Loire, Paris, France

Filed May 11, 1983, Ser. No. 493,490
Claims priority, application France, Jun. 4, 1982, 82 09775
Int. Cl.[3] B41F 1/46
U.S. Cl. 101—363 4 Claims



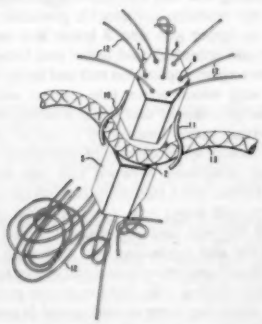
1. A low-blade type inking mechanism comprising an ink duct roller (1) and an ink duct (4), a pivot axis parallel to said roller, said ink duct being mounted on said pivot axis for rotation about said pivot axis, said ink duct carrying at least one detachable trough (7), containing ink and having an edge contacting said ink duct roller, means to enable removal of said trough from said ink duct without loss of any ink contained in said trough, said means including means to move said pivot axis along a path concentric with the axis of said ink duct roller without moving said edge of said trough which contacts said ink duct roller out of contact with said ink duct roller to thereby tilt said trough so that the ink contained therein moves away from said edge of said trough which contacts said ink duct roller, said ink duct being rotatable about said pivot axis to provide clearance and thereby enable said trough to be removed from said ink duct.

4,481,884

FIELD-CONNECTED EXPLOSIVE BOOSTER FOR INITIATING LOW-ENERGY EXPLOSIVE CONNECTING CORDS

Malak E. Yunan, Boonton Township, Morris County, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1981, Ser. No. 334,889
Int. Cl.[3] F42B 3/00
U.S. Cl. 102—313 14 Claims



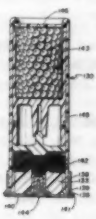
1. An explosive booster for initiating a propagative explosion in at least one low-energy explosive connecting cord comprised of a linear charge of explosive surrounded by a protective sheath, said booster comprising a detonating explosive charge in the form of a rod provided with at least one perforation extending through the entire length, and substantially parallel to the longitudinal axis, thereof for threading said low-energy explosive connecting cord(s) through, and for enclosing a section of said low-energy cord(s) within, said rod, said booster explosive charge being adapted (a) to be detonated by a blasting cap or by the side-output of a detonating cord in contact therewith, and (b) to apply an initiation impulse to the linear explosive charge in the section(s) of low-energy connecting cord enclosed within said rod for the propagation of an explosion through said low-energy cord(s).

4,481,885

ONE-PIECE SHOTSHELL

Jack A. Erickson; Luke J. Davich, both of Anoka, and Richard W. Proulx, Forest Lake, all of Minn., assignors to Federal Cartridge Corporation, Minneapolis, Minn.

Division of Ser. No. 117,580, Feb. 1, 1980, Pat. No. 4,332,766.
This application Jan. 15, 1982, Ser. No. 339,765
Int. Cl.[3] F42B 5/30
U.S. Cl. 102—467 48 Claims



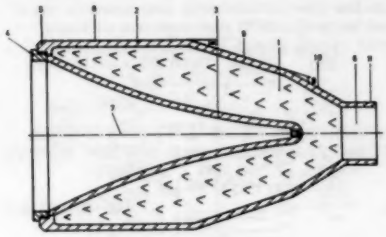
1. A single piece shotshell casing, said casing being constructed and arranged to be utilized without a separate basewad and being made of thermoplastic material and comprised of a tubular body having inner wall surfaces and having an integral transverse base portion constituting an integral internally homogeneous basewad formed from a length of said tubular body at one end thereof with a longitudinally extending primer opening therein and being telescoped in contiguous relation with said inner wall surfaces and within said tubular body at said end.

7. A single piece shotshell casing designed specifically to reduce the likelihood of tube failure above the base and at the forward end of its surrounding head upon firing, said casing being constructed and arranged to be utilized without a separate basewad and being comprised of a tubular body having wall structure with inner surfaces and which is made of a thermoplastic material and having a substantially thickened integral transverse base section at one of its end portions constituting an integral internally homogeneous basewad formed of a length thereof with a longitudinally extending primer opening therein, said base section being telescoped in contiguous relation with said inner surfaces and within said end portion of said tubular body, said base section having no internal physical boundaries.

4,481,886
HOLLOW CHARGE

Leif Brattström, Karlskoga, Sweden; Kjell Mattsson, San Leandro, Calif., and Bertil Arvidsson, Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Jan. 14, 1983, Ser. No. 458,100
Claims priority, application Sweden, Jan. 15, 1982, 8200194
Int. Cl.³ F42B 1/02
U.S. Cl. 102—476 **5 Claims**



1. A hollow charge for a missile, projectile, shell or the like, comprising:

a charge body of explosive material, said charge body having a total length;

an inner jet-forming trumpet-shaped cone member formed within and opening outwardly at one end of said charge body, said trumpet-shaped cone member having a length and a generatrix tangent angle in the range of 10 degrees to 15 degrees; and

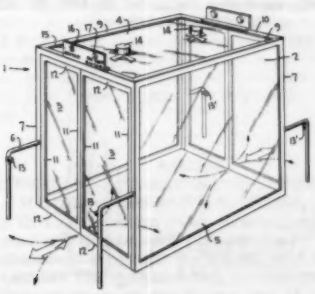
an outer casing enclosing said charge body, said casing having a substantially straight cylindrical part extending along said charge body from said one end, said cylindrical part being connected to a conical, tapered part extending further along said charge body, the ratio between said length of said trumpet-shaped cone member and said total length of said charge body being approximately 0.8:1;

whereby a hollow charge jet generated on ignition of said charge body has a front tip velocity of approximately 10000 m/s and a velocity gradient lower than would be obtained by a straight cone member.

4,481,887
SECURITY DOORS

Enrique Urbano, c/o Jose L. Castro 250 Catalonia, Coral Gables, Fla. 33134

Filed Aug. 31, 1982, Ser. No. 413,499
Int. Cl.³ F05G 5/02
U.S. Cl. 109—3 **6 Claims**

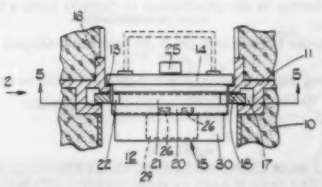


1. A security door system for a building, office, or the like of the type wherein a vestibule is provided as the passageway through which people must enter and leave comprising, an outer door, an inner door, an enclosed passageway between said outer and inner doors comprised of a floor, ceiling and side walls, said doors, side walls, ceiling and floor being formed of panels of bullet-proof material joined together at their edges, door operating means to open and close said doors, entrance detector means for each door to detect the presence of a person in position to enter said passageway and operably connected to said door operating means to cause said door operating means to open the door at which said person is detected and to close said door when said person is inside said passageway, door closing detector means to detect the closed position of said door, time delay means operably connected to said door closing detector means to be energized thereby and operably connected to said door operating means for the other door so that after a pre-set time delay the door operating means for said other door opens said other door to allow said person to exit therethrough, locking control means operably connected to said door operating means to selectively prevent said door operating means from opening any of said doors after said person is inside said passageway to thereby imprison said person within said passageway, said vestibule being constructed of a hollow framework formed of vertical and horizontal frame members and door frames for said doors, said panels being attached at their edges to said frame members, said inner and outer doors each comprising a set of double doors connected by hinges at their vertical outer edges to said door frames for swinging movement, the inner edges of each set of doors meeting in abutting relationship when closed at substantially the center of the doorway, said panels being transparent and attached to said framework, and further comprising venting means to ventilate said passageway, and green and red indicating lights provided adjacent each doorway operably connected to said door operating means to provide visual signals to control traffic through said passageway.

4,481,888
SAFES

Winston G. Cartwright, Talke, and Alan Gater, Porthill, both of England, assignors to Darglen Engineering Limited, Staffordshire, England

Filed Nov. 23, 1981, Ser. No. 323,923
Claims priority, application United Kingdom, Jan. 3, 1981, 8100058
Int. Cl.³ E05G 1/04
U.S. Cl. 109—50 **11 Claims**



1. A safe comprising a chamber having an access opening and a closure which is movable into and out of said opening, first and second peripheral grooves in said opening and said closure respectively, means on said opening and said closure for locating said closure in said opening so that said first and second grooves are substantially aligned, a rigid annular element which is captive in one of said grooves and which is movable between an unlocked position in which there is clearance between said element and the other of said grooves, and a locked position in which said element engages both of said grooves, in both of which locked and unlocked positions said element surrounds said closure when the latter is located in said opening, and a member slidable in said closure transversely of the axis of said element, said member being engage-

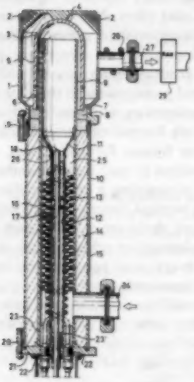
able with said element to urge the latter in respective opposite directions between said locked and unlocked positions.

4,481,889

METHOD AND APPARATUS FOR AFTERBURNING FLUE GASES

Ake Sikander, Stockholm; Ake Björkman, and Günther Jönsson, both of Karlskrona, all of Sweden, assignors to Lumalampan Aktiebolag, Karlskrona, Sweden

Continuation-in-part of Ser. No. 442,767, Nov. 18, 1982, Pat. No. 4,468,011. This application May 25, 1983, Ser. No. 498,012
Claims priority, application Sweden, Nov. 30, 1982, 8206846
Int. Cl.³ F22B 5/00; F23C 9/00; F23G 7/06
U.S. Cl. 110—212 **42 Claims**



1. A method of afterburning flue gases, comprising:

pre-heating said flue gases in a first inlet duct of a burner by means of a heating device in said first inlet duct of said burner, said burner having an opening into an afterburner;

supplying at least one combustion gas through a second inlet duct to contact said preheated flue gases in said burner;

forcibly mixing the preheated flue gases with said at least one combustion gas to form a mixed gas in said burner;

causing the mixed gas to undergo substantially complete combustion in a flame from said burner and directing said flame to contact a bowl-shaped insert facing the opening of the burner in the afterburner to thereby form a burned out gas;

removing the burned out gas from said bowl-shaped insert; and

discharging said removed burned-out gas from said afterburner to the ambient air.

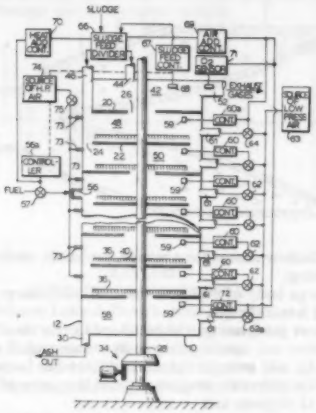
4,481,890

METHOD FOR CONTROLLING TEMPERATURES IN THE AFTERBURNER AND COMBUSTION HEARTHS OF A MULTIPLE HEARTH FURNACE

Frederick M. Lewis, Mountain View, Calif., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 192,021, Sep. 29, 1980, Pat. No. 4,391,208. This application Sep. 24, 1982, Ser. No. 423,211
Int. Cl.³ F23G 5/00
U.S. Cl. 110—225 **6 Claims**

1. In a method of incinerating combustible waste in a multiple hearth furnace containing a series of superimposed hearths comprising a drying hearth, a combustion hearth and an ash cooling hearth in descending order, which method comprises passing the waste material downward through said hearths where the inert solid products of combustion are removed from the ash-cooling hearth, supplying air to the multiple hearth furnace sufficient to combust the waste material, while the gaseous products of combustion flow upward countercurrent to the flow of waste material through said hearths and into an afterburner to remove the malodorous gases and/or pollutants, said afterburner located after the uppermost waste handling drying hearth in respect to the direction of the countercurrent flow of the gases, the improvement which comprises (A) controlling the temperature of the combustion hearth to operate at a temperature at or below a preselected maximum temperature by splitting the waste material by means of a sludge feeder divider between the uppermost waste handling drying hearth and the combustion hearth in such proportions



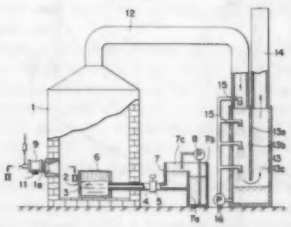
as to maintain the temperature of the combustion hearth located directly below the uppermost waste handling drying hearth at or below said preselected temperature, operating said feed sludge divider to distribute the waste material between the uppermost drying hearth and the combustion hearth in response to the temperature in the combustion hearth, and (B) controlling the temperature of the afterburner at or below a preselected maximum temperature by controlling the amount of air introduced into the furnace in response to the temperature in the afterburner.

4,481,891

APPARATUS FOR RENDERING PCB VIRULENCE-FREE

Shigeo Takeshita, Yokohama, and Yoshiaki Kitamura, Miyamacho, both of Japan, assignors to Kabushiki Kaisah Kitamuragokin Seisakusho, Gifu, Japan

Filed Jul. 28, 1983, Ser. No. 518,134
Claims priority, application Japan, Jul. 30, 1982, 57-132059
Int. Cl.³ F23G 7/04
U.S. Cl. 110—238 **1 Claim**



1. An apparatus for rendering PCB virulence-free comprising:

a combustion furnace;

a combustion vessel disposed at the substantial center of said combustion furnace;

a grid provided in said combustion vessel and dividing the interior thereof into an upper and lower section;

catalyst particles provided as a layer in said upper section of said combustion vessel;

a PCB tank communicating with said lower section of said combustion vessel, for filling said combustion vessel with a constant quantity of PCB;

a burner and a fan interchangeably brought to a position in opposition to an opening of said combustion furnace; and

a gas treatment tank communicated with said combustion furnace via an exhaust duct, for absorbing and neutralizing chlorine gas contained in exhaust gas fed through said exhaust duct.

4,481,892

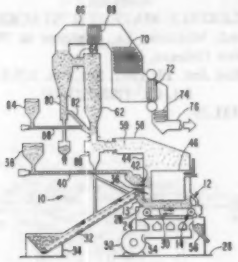
ATMOSPHERIC FLUIDIZED BED COMBUSTOR

Clifford S. Mah, 5421 Home Ct., Carmichael, Calif. 95608

Filed Aug. 3, 1983, Ser. No. 519,943

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—263 **10 Claims**



1. A fluidized bed combustion system comprising: means defining a primary combustion region; a movable, perforate support in said combustion region for supporting fuel particles; first fuel feed means adjacent to said defining means for feeding relatively large fuel particles toward and onto the support; second fuel feed means spaced above the first fuel feed means for feeding relatively small fuel particles toward said support; means below the support for creating a flow of air upwardly through the support and into a zone above the support, whereby some of the fuel particles will be fluidized to present a fluidized bed within the combustion region; means above the primary combustion region for forming a secondary combustion region whereby fuel fines directed upwardly with the combustion gases from the primary combustion region can be burned; means at a location spaced above the secondary combustion region for scrubbing the combustion gases therefrom to remove the sulfur content, said scrubbing means including means for directing sorbent particles into the path of travel of the combustion gases flowing from said secondary combustion region; and means downstream of the scrubbing means for placing the combustion gases in heat exchange relationship to a fluid.

4,481,893

METHOD AND APPARATUS FOR AUTOMATICALLY HANDLING REUSABLE SEEDLING UNITS

Bengt G. L. Qvarnström, Falun, Sweden, assignor to Stora Kopparbergs Bergslags AB, Falun, Sweden

Continuation-in-part of Ser. No. 267,883, May 27, 1981, Pat. No. 4,408,549. This application Dec. 13, 1982, Ser. No. 449,382

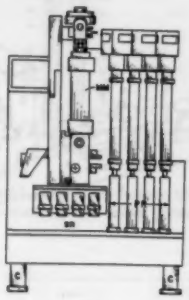
Claims priority, application Sweden, Jun. 13, 1980, 8004415

Int. Cl.³ A01C *11/02*

U.S. Cl. 111—2 **20 Claims**

1. In a system of elevated mass growing of plant seedlings for subsequent replanting, the mass growing being in reusable units of the type having a plurality of pot cells joined together in side-by-side relationship in an array forming a tray-like structure, a method to ensure that all the pots in each tray are occupied by acceptable seedlings, the method comprising:

providing means to controllably advance the trays past a sensing station and sensing the array of pots in each tray by sensor means to identify pot-locations in the array which do not have an acceptable seedling;



providing means for holding the identified locations in mechanical, electrical or electronic memory; and

selectively evacuating the identified pot-locations by mechanically actuated means in preparation for receiving acceptable replacement seedlings; and

providing means replacing seedlings at the evacuated locations; and forcing the seedlings to a transplant stage.

4,481,894

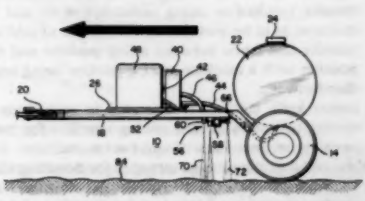
HERBICIDE SPREADER

Gary K. Brenn, Washington, Ill., assignor to Bron Electronics, Inc., Flat Rock, N.C.

Filed May 20, 1982, Ser. No. 380,415

Int. Cl.³ A01C *23/02*

U.S. Cl. 111—6 **5 Claims**



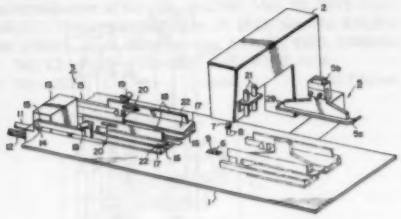
1. Apparatus for dispersing liquid herbicide on the ground comprising a vehicle for movement along the ground, means on said vehicle for carrying a quantity of said liquid herbicide, substantially vertically downwardly directed liquid nozzle means carried by said vehicle, means including pump means carried by said vehicle and connected to said liquid nozzle means and to said liquid herbicide carrying means for projecting a spray of liquid substantially vertically down toward the ground, substantially vertically downwardly directed air nozzle means carried by said vehicle adjacent to and in alignment with said liquid nozzle means, and air pressure means connected to said air nozzle means for projecting air jets substantially vertically down toward the ground said air nozzle means being disposed behind the liquid nozzle means in the direction of movement of said vehicle to drive liquid into the ground.

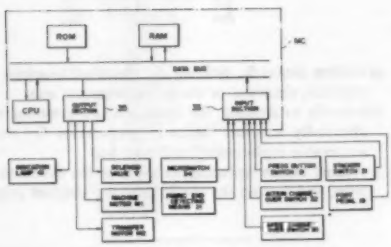
4,481,895

PIPING SEWING DEVICE

Hideo Asao, Mitaka, and Satoru Yasuda, Tokyo, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Japan

Filed Apr. 30, 1982, Ser. No. 373,671
Claims priority, application Japan, May 9, 1981, 56-69897
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **1 Claim**





1. A piping sewing device comprising:

a machine motor,

a sewing machine associated with said machine motor, said sewing machine having two needles fixedly disposed on a top surface of a bench for forming two substantially parallel seams,

a transfer motor being operated in response to pulse signals to be input,

a fabric transfer mechanism for holding a fabric, said fabric transfer mechanism being associated with said transfer motor so as to be movable on the surface of said bench to transfer said fabric between a first position and a second position with a machine sewing portion being interposed therebetween,

a center knife mechanism operated in association with a sewing operation of said sewing machine for cutting an opening between lines of said two seams,

fabric end detecting means arranged for detecting the end of the transferred fabric at a position before said machine sewing portion in a fabric transfer direction of the sewing operation,

input means for inputting data, said input means including a plurality of switches to be operated by an operator,

first memory means for storing at least one of a plurality of different pattern numbers and length data of the seam lines to be stitched on the fabric in response to an operating mode of said input means,

second memory means for storing information for effecting fabric end signals of said fabric end detecting means and its pattern number,

selection means including a plurality of manually operated switches,

third memory means for reading and storing at least one of a plurality of pattern numbers and the corresponding length data from said first and second memory means and further storing an operation order of said pattern numbers and length data,

a counter for counting pulse signals applied to said transfer motor,

computing means for computing a time period of drive and stop of said machine motor in connection with the counted value of said counter in accordance with the fabric end signal and the length data,

a first control circuit for starting said fabric transfer mechanism from said first position and reciprocally moving the same between said first position and said second position in connection with the starting operation, said first control circuit driving and stopping said machine motor in connection with the computed data as said mechanism moves from said first position to said second position,

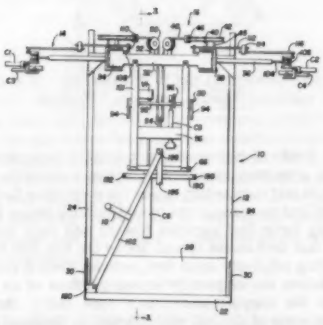
a second control circuit for cyclically effecting the stored data in said third memory means in accordance with the operating order at every return of said fabric transfer mechanism to the first position in connection with a particular counted value of said counter.

4,481,896

FLEXIBLE MATERIAL STACKER

Todd Drummond, Metairie, La., assignor to Wembley Industries, Inc., New Orleans, La.

Filed Jan. 13, 1982, Ser. No. 339,216
Int. Cl.³ D05B *33/00*
U.S. Cl. 112—121.29 **7 Claims**



1. An apparatus for removing flexible material from a workstation at which at least two distal portions of the flexible material are accessible to said apparatus and for stacking the flexible material for further processing, said apparatus comprising,

a frame,

first and second arms each having first and second ends, said first ends having pivotal mountings on said frame such that said arms may be rotated toward and away from one another and said second ends having gripping means adapted for gripping and subsequently releasing one of said distal portions of flexible material,

means for rotating said arms about said pivotal mountings from a first position in which they are away from one another whereby said gripping means can grip their respective distal portions to a second position in which gripped material is extended to substantially its full length,

means for receiving said material from said gripping means upon release of said material by said gripping means when said arms are in said second position, and

control means for causing said gripping means to grip their respective distal portions of said material when said arms are in said first position, then for causing said rotating means to pivot said arms to their second position, then for causing said gripping means to release said distal portions,

and then for causing said means for rotating to pivot said arms to said first position,

whereby said material is received by said receiving means.

4,481,897

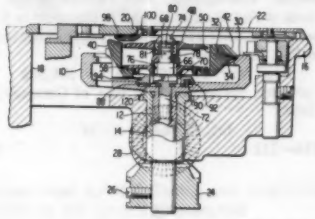
CLUTCHING ARRANGEMENT FOR A SEWING MACHINE BOBBIN

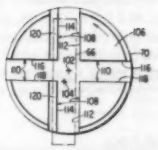
Charles R. Odermann, Montville, and Robert H. Larsen, Middletown, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jun. 16, 1983, Ser. No. 505,009

Int. Cl.³ D05B *57/26, 59/00*

U.S. Cl. 112—279 **5 Claims**





1. In combination, a sewing machine bobbin, a first clutch part rotationally affixed in the bobbin, a rotatable second clutch part for rotating the first part and thereby the bobbin, the first or second part being axially movable for operably connecting the said parts, one of the clutch parts including a single bladed paddle and the other clutch part including a pair of crossed paddle receiving through slots which extend perpendicular to the rotational axis of the part, the crossed slots having side walls which are parallel to said axis, and one slot, but not the other having a longitudinally extending upper edge chamfered at an angle effective to substantially widen the mouth of the slot.

4,481,898

SLURRY CARRYING SHIP

Tatsuya Murahashi, Sennan; Yasuo Nakai, Osaka, and Kazuyoshi Hosogaya, Nabari, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

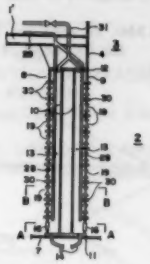
Filed May 3, 1982, Ser. No. 374,242

Claims priority, application Japan, May 7, 1981, 56-66460; May 7, 1981, 56-66461; May 7, 1981, 56-66462

Int. Cl.³ B63B *25/08*

U.S. Cl. 114—74 R **9 Claims**

1. A slurry carrying ship comprising at least one cargo hold for accommodating cargo slurry, the or each hold being provided with a hatch, wherein the or each hold is provided therein with at least one upstanding hollow post disposed beneath the hatch at a location close thereto and away from side walls defining the hold for supporting a wall in which said hatch is formed, and said post is divided by a longitudinal partition or partitions to provide a plurality of parallel water passages, said post being formed on part of its wall or walls with drainage ports communicating said water passages and



provided with filters, said post being further provided with discharge means communicating said water passages.

4,481,899

FLOATING PLATFORM STRUCTURE

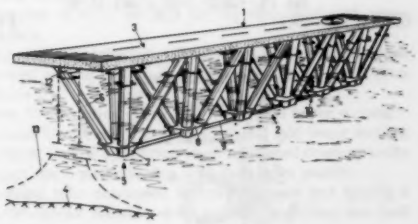
Tomas B. Einstabland, Asker, and Olav Olsen, Lysaker, both of Norway, assignors to Ingenior F. Selmer A/S, Oslo, Norway

Filed Sep. 28, 1982, Ser. No. 426,043

Claims priority, application Norway, Oct. 7, 1981, 813389

Int. Cl.³ B63B *35/44, 35/33*

U.S. Cl. 114—264 **8 Claims**



5. A floating platform module structure, in which:

a. a deck member and a support section therefor are provided, together comprising an open trussed girder section wherein the deck member forms an upper chord section and the support section has a lower chord section and truss members between the upper chord section and the lower chord section;

b. the truss members are arranged in an inverted multilateral sided pyramid-shaped group having a diagonal truss member in each descending pyramid edge;

c. said pyramid-shaped group has the truss members at the inverted base thereof rigidly connected to the underneath side of the deck member;

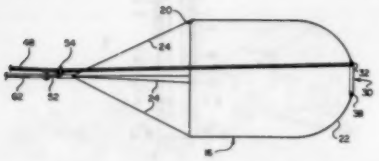
d. the lower end portions of the truss members of the inverted equilateral pyramid-shaped group are rigidly connected with one another by a lower junction at the inverted pyramid apex; and

e. buoyancy means are provided in the upper portions of truss members and ballast means are provided in the lower portions of the truss members.

4,481,900
SEA ANCHOR

Peter T. Rutten, Plainfield, Ill., and James E. Kalinowski, Minneapolis, Minn., assignors to Blue Harbor, Inc., Hopkins, Minn.

Filed Mar. 25, 1982, Ser. No. 361,829
Int. Cl.³ B63B *21/48*
U.S. Cl. 114—311 **5 Claims**

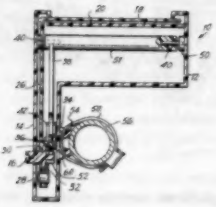


1. A sea anchor made of cloth or the like comprising a body open at one end and at least partially closed at the other end, said body including a tubular portion open at the front end and having a substantially hemispherical portion at the rear end tapering to a substantially closed apex, a plurality of elongated tow members secured to the periphery of the open end in arcuate spaced relation, an elongated tow rope to which said tow members are connected for securement to a boat for sea-anchoring said boat, and additional means comprising a line secured to said body substantially hemispherical portion apex and remotely operable from said boat for at least partly turning said body inside out, and guide means secured adjacent the connection of said tow members and said tow rope and through which said line extends.

4,481,901
GEARSHIFT INDICATOR WITH RANGE ADJUSTMENT

William Blasnik, Englewood, N.J., assignor to Thomas R. Morrison, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,348
Int. Cl.³ G01D *5/02*; F16H *35/00*
U.S. Cl. 116—28.1 **1 Claim**

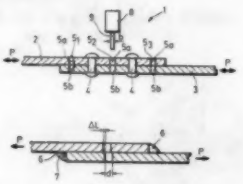


1. A gear indicator for a multi-speed vehicle comprising:
a housing;
means for securing said housing to said multi-speed vehicle;
means in said housing for measuring a slope of a surface on which said vehicle is disposed;
means for indicating a gear appropriate for use with said slope;
said means for indicating including a rod pivoted to said housing, a first arm pivotably supported by said rod, and a pendant weight affixed to said arm;
a sector gear affixed to said first arm;
a pinion pivoted in said housing and engaging said sector gear;
said sector gear being angularly deflected with respect to said pinion by an angular position of said vehicle disposed on said slope whereby said pinion is rotated to an angle related to said slope;
said means for indicating including a second arm disposed for concerted rotation with said pinion and a pointer on said second arm;
a scale shelf adjacent said pointer;
indicia on said scale shelf related to a gear appropriate to said slope; and
means for permitting an angular adjustment of said pinion with respect to said second arm whereby a relationship between a value of said slope and an indication of a gear on said scale shelf appropriate for use with said slope may be changed.

4,481,902
METHOD AND APPARATUS FOR TESTING OVERLAPPING CONNECTIONS IN STRUCTURAL COMPONENTS

Jochen Meyer, Rosengarten, and Richard Wilde, Eversen-Heide, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 17, 1982, Ser. No. 358,858
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111698
Int. Cl.³ G01B *13/24*
U.S. Cl. 116—212 **16 Claims**



1. A method for testing an overlapping connection between normally rigidly interconnected structural components wherein at least two overlapping, rigidly interconnected members form the connection along an interface between the two adjacent members which normally maintain their position relative to each other unchanged, comprising the following steps: making at least one test hole into or through the interconnected members and through said interface in their new condition or form test hole portions which are in axial register with each other as long as the connection is in a satisfactory condition as evidenced by the unchanged position of said two members relative to each other, checking during the operational life of the connection whether adjacent test hole portions are still in axial register with each other and hence substantially free of any effects which would appreciably affect the strength of the connection, and noting any displacement of said members relative to each other as a result of load applications.

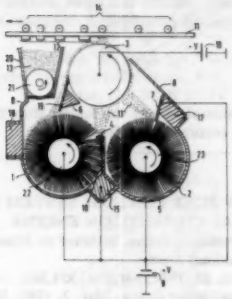
4,481,903
APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE ON A RECORDING MEDIUM

Helmuth Haberhauer, Taunusstein, and Gerhard Spingath, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,384
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205989
Int. Cl.³ G03G *15/08*
U.S. Cl. 118—653 **12 Claims**

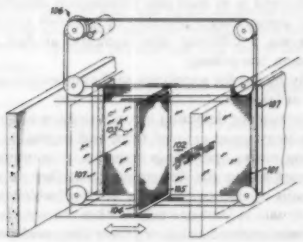
1. An apparatus which utilizes an electrically charged single component developer for developing an electrostatic latent image which has been generated on a recording medium, comprising:

a developing roller for conveying a single component developer onto a latent image carried on the recording medium;
charging means for charging said single component developer, said charging means comprising two rotating charging devices, said charging devices being spaced from said developing roller and being separated from one another by a distance which is less than the spacing of either of said charging devices from said developing roller;



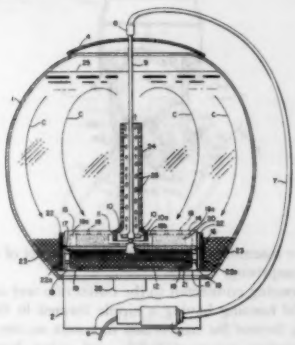
a developer feed unit for feeding said single component developer to said charging means; and
scraper means associated with said charging means and in glancing contact with a surface of said charging means for imparting an additional charge to said developer and for separating and transferring said charged developer from said charging means to said developing roller, said scraper means comprising a scraper device associated with each of said two charging devices.

4,481,904
FISH CONSERVATION DEVICE
Richard I. Fletcher, Star Rte. 61, Damariscotta, Me. 104543
Filed Jun. 28, 1983, Ser. No. 508,600
Int. Cl.³ E02B *8/08*
U.S. Cl. 119—3 **7 Claims**



1. Apparatus for herding and conserving fish, comprising:
(a) sidewalls defining an intake area through which water can flow;
(b) means defining at least one bypass conduit adjacent to one of said sidewalls with an open end facing into said intake area to admit fish otherwise entrapped in said intake area;
(c) a barrier screen oriented generally normal to the direction of water flow and located adjacent to said bypass conduit;
(d) a fish-herding means of a height sufficient to span the water depth of said intake area, said fish-herding means being constrained to move across the face of said barrier screen while maintaining an orientation perpendicular to the plane of said barrier screen; and
(e) means for driving said fish-herding means for movement across the surface of said barrier screen toward said bypass conduit so that fish entrapped in said intake area are herded away from said barrier screen into said bypass conduit.

4,481,905
AQUARIUM WITH IMPROVED AERATOR AND PURIFIER
Oscar O. Fonseca, 3054-1/2 San Bruno Ave., San Francisco, Calif. 94134
Filed Jul. 1, 1983, Ser. No. 509,944
Int. Cl.³ A01K *63/04*; E04H *3/20*
U.S. Cl. 119—5 **4 Claims**



1. An aquarium tank having positioned within it upon its bottom a combined purifier and aerator comprising a cartridge and a gravel bed communicating therewith, said cartridge comprising:
an upper section and a lower section communicating with each other;
a plurality of holes through the top surface of said upper section;
a plurality of smaller holes through said lower section positioned around its periphery and adjacent to the bottom thereof;
a first filter medium positioned within said upper section;
a second filter medium positioned within said lower section;
a vertical hollow cylindrical stack positioned concentrically upon and communicating with said upper section;
a vertical tube positioned within said stack and having a cross-shaped member at its bottom projecting into said upper section;
a cup-shaped receptacle in the form of an inverted cup positioned within said upper section surrounding said cross-shaped member and communicating with said stack;
a source of compressed air introduced through said vertical tube;
said air being disposed to exit from holes in the end of said cross-shaped member and impinge upon the interior of said cup-shaped receptacle;
whereby an upward flow of air through said stack is created and a consequent suction is formed on the interior of said cartridge and said gravel bed;
thereby causing circulation of water downward in said tank and through said cartridge and simultaneously through said gravel bed;
said gravel bed comprising:
a perforated hollow cylindrical ring surrounding said cartridge in close proximity thereto;
a bed of gravel positioned between said ring and the interior wall of said aquarium tank;
means for permitting water flow from the lower part of said

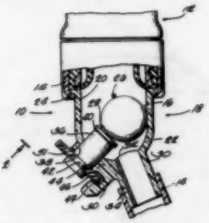
gravel bed to said second filter medium and upwards through said first filter medium and said vertical tube.

4,481,906

VALVE FOR USE IN A SUCTION LINE

Gary C. Steingraber, Madison, and Terrence J. Mullen, Sun Prairie, both of Wis., assignors to DEC International, Inc., Madison, Wis.

Filed Jul. 25, 1983, Ser. No. 516,757
Int. Cl.³ A01J 5/08
U.S. Cl. 119—14.32 **4 Claims**



1. A valve assembly for mounting in the outlet of a teat cup assembly comprising:

a valve housing connected to the outlet of a teat cup assembly, said housing having a nipple formed in the bottom portion thereof for connection to a milk suction line;

a ball member mounted inside said valve housing and adapted to seat at the opening from said housing into said nipple when the interior of said housing is exposed to atmospheric pressure, the relationship between said ball member and said nipple opening on which it seats is such that there will be a small leakage path past said ball member when said ball member is seated on said nipple opening; and

a plunger slidably mounted in an opening in the wall of said valve housing, said plunger means adapted to slide inwardly into said valve housing when the pressure in said housing falls below atmospheric pressure, said inward movement of said plunger adapted to dislodge said ball member from its seated position at the nipple opening, said plunger means further including a washer member of resilient material mounted thereon exteriorally of said housing wall, said washer member adapted to move into sealing engagement with said housing wall when said plunger slides inwardly into said housing to thereby prevent leakage of air around said plunger and into said housing.

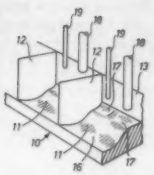
4,481,907

METHOD AND APPARATUS FOR FEEDING ANIMALS

Steen Blicher, Fåborg, Denmark, assignor to Biomat, Inc., Chicago, Ill.

PCT No. PCT/DK82/00042, § 371 Date Jan. 10, 1983, § 102(e) Date Jan. 10, 1983, PCT Pub. No. WO82/03967, PCT Pub. Date Nov. 25, 1982
PCT Filed May 11, 1982, Ser. No. 459,534
Claims priority, application Denmark, May 11, 1981, 2080/81
Int. Cl.³ A01K 5/02
U.S. Cl. 119—51 R **15 Claims**

1. A method of simultaneously feeding a plurality of animals which are able to move freely within the same enclosure, said method comprising supplying during a feeding period equal amounts of fodder to a number of separate feeding places corresponding to the number of animals in the enclosure, at a slow rate not exceeding the maximum eating rate of any of the animals, said feeding places comprising eating sections and supply sections, at least part of the fodder being supplied to each separate feeding place at the supply section thereof where the respective animal can eat the fodder only with difficulty



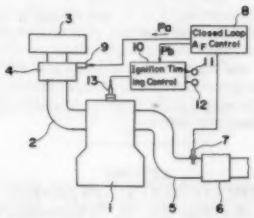
thereby causing the animal to rake the fodder from the supply section to the eating section of the feeding place.

4,481,908

CLOSED-LOOP FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Katsuyoshi Iida, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 23, 1982, Ser. No. 351,361
Claims priority, application Japan, Mar. 2, 1981, 56-30129
Int. Cl.³ F02B 43/00
U.S. Cl. 123—1 A **5 Claims**



1. A closed loop fuel control system for an internal combustion engine wherein a combustible mixture of air with combined fuel is burned in at least one combustion chamber, said combined fuel comprising a plurality of ignitable vaporizable fuels each having a different stoichiometric air-fuel mixing ratio, said system comprising:

a fuel supply means for supplying said combustible mixture into said at least one combustion chamber;

an exhaust sensor for detecting a concentration of a component of exhaust gases emitted from said engine;

a determining means operable in response to an output from said exhaust sensor for determining whether an air-fuel mixing ratio of said combustible mixture which is to be supplied to said at least one combustion chamber is higher than a predetermined value or lower than said predetermined value and for providing an output in response to said determination;

a fuel control means operable in response to said output from said determining means for generating an output signal which is input to said fuel supply means so as to control said air-fuel mixing ratio to be equal to said predetermined value;

a detecting means for detecting a change in composition of said combustible mixture in dependence on a change in said output signal from said fuel control means and for providing an output in response to said detection;

wherein said engine has an operating parameter having a required control value which is variable according to a change in composition of said ignitable vaporizable fuel, said operating parameter being other than said air-fuel mixing ratio;

said system further comprising a basis control means for

controlling said operating parameter in dependence on an operating condition of said engine; and

a compensating means operatively connected to said detecting means for correcting said operating parameter in dependence on said output from said detecting means.

4,481,909

TWO-CYCLE INTERNAL COMBUSTION ENGINE

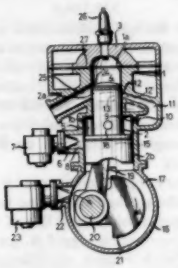
Toshiyuki Takada, Miki, and Hitoshi Yamamoto, Hyogo, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 16, 1983, Ser. No. 466,783

Claims priority, application Japan, Feb. 19, 1982, 57-26387

Int. Cl.³ F02B *33/14*

U.S. Cl. 123—73 CC **3 Claims**



1. A crankchamber precompression type two-cycle internal combustion engine comprising:

at least one cylinder assembly, each cylinder assembly comprising;

a stepped cylinder constituted by a minor diameter cylinder portion and a major diameter cylinder portion;

a stepped piston received in said stepped cylinder and constituted by a minor diameter piston portion and a major diameter piston portion adapted to be fitted in said minor diameter cylinder portion and said major diameter cylinder portion respectively;

a working chamber defined between said minor diameter cylinder portion and said minor diameter piston portion;

an annular sub-intake chamber defined between said major diameter cylinder portion and said minor diameter piston portion;

a crankchamber connected to said major diameter cylinder portion;

a auxiliary carbureator connected to said annular sub-intake chamber through a check valve only allowing a fuel-air mixture to flow toward said sub-intake chamber;

a main carburetor connected to said crankchamber through a check valve only allowing a fuel-air mixture to flow toward said crankchamber; and

a main scavenging passageway connecting said crankchamber with said working chamber;

wherein the improvement resides in setting said auxiliary carburetor and said main carburetor in such a manner that the former forms a mixture of fuel of high quality and air and the latter forms a mixture of fuel of low quality and air and providing said working chamber with not only a main scavenging port but also an auxiliary scavenging port, said auxiliary scavenging port being in communication with said sub-intake chamber through a super-charging reservoir, with a check valve only allowing a fuel-air mixture to flow toward said super-charging reservoir being mounted between said sub-intake chamber and said super-charging reservoir, said auxiliary scavenging port being formed in the position where said auxiliary scavenging port is opened and closed simultaneously with said main scavenging port by the movement of the minor diameter piston portion by the stroke of the piston, and the pressure at which the check valve mounted between said sub-intake chamber and said super-charging reservoir opens being set at a level at which the mixture flows from said sub-intake chamber to said super-charging reservoir after the piston blocks and auxiliary scavenging port.

4,481,910

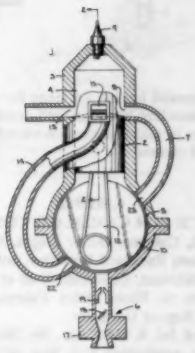
STRATIFIED-CHARGE TWO-STROKE CYCLE ENGINE

Benjamin L. Sheaffer, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 29, 1983, Ser. No. 566,493

Int. Cl.³ F02B *33/04*; F24B *13/04*

U.S. Cl. 123—73 R **10 Claims**



1. A stratified-charge two-stroke cycle scavenged spark-ignition engine comprising

a piston reciprocal in a cylinder between a combustion chamber and a crankcase,

means for supplying fuel into said crankcase,

a fuel-air transfer passage between said crankcase and a fuel-air inlet port in said combustion chamber,

an exhaust port in said combustion chamber, and

an elongated air passage having an input for receiving external air and extending between said crankcase and an air inlet port in said combustion chamber and of a length great enough to reduce fuel mixture therein and afford substantially only air at said air inlet port to substitute air for exhaustion at said exhaust port instead of otherwise unburned fuel mixture from said fuel-air inlet port, to reduce fuel consumption by substantially reducing exhaustion of unburned fuel mixture.

4,481,911

STRATIFIED-CHARGE CROSS-FLOW SCAVENGED TWO-STROKE CYCLE ENGINE

Benjamin L. Sheaffer, Oshkosh, and John M. Griffiths, Fond du Lac, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 29, 1983, Ser. No. 566,676

Int. Cl.³ F24B *13/04*; F02B *33/04*

U.S. Cl. 123—73 R **12 Claims**

1. A stratified-charge cross-flow scavenged two-stroke cycle spark-ignition engine comprising

a piston having a raised and chamfered crown with a baffle and reciprocal in a cylinder between a combustion chamber and a crankcase,

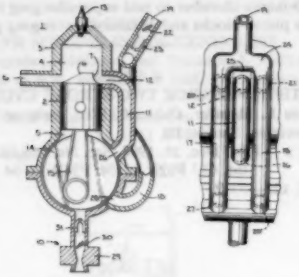
means for supplying fuel to said crankcase,

an exhaust port in said combustion chamber,

a plurality of transfer passages between said crankcase and said combustion chamber including

a fuel-air transfer passage between said crankcase and a fuel-air inlet port in said combustion chamber facing

said baffle on said piston crown and approximately 180° opposite said exhaust port,



air passage means having an input for receiving external air and extending between said crankcase and air inlet port means in said combustion chamber proximate said chamfered crown.

4,481,912

DEVICE FOR CAMSHAFT CONTROL

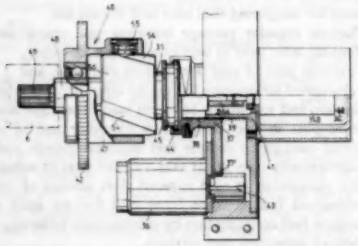
Andreas Stwiorok, Cologne; Dieter Stojek, Bergisch-Gladbach; Reinhold Blauhut; Burkhard Brandner, both of Werdohl, and Manfred Knuefelmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Firma Atlas Fahrzeugtechnik GmbH, Werdohl, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,265

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127766

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.15 **8 Claims**



1. A device for the angular positional adjustment of the camshaft of an internal combustion engine with respect to the crankshaft of that engine, according to measured speed and load conditions and predetermined correctional data for optimizing engine torque, including:

(a) a toothed ring coupled to the crankshaft of said internal combustion engine where said ring contains one reference tooth which is fixed and permanently associated with one position of the crankshaft;

(b) a transducer cooperating with said toothed ring and therewith functioning as a pulse generator producing tooth, or counting, pulses corresponding to every sensed tooth and one reference pulse corresponding to the sensed reference tooth;

(c) a transducer arranged to sense the dynamic load on said engine;

(d) an ignition circuit which controls said engine and which

(1) receives all inputs and/or pulses from said transducers,

(2) receives normal ignition trigger signals,

(3) outputs spark or equivalent signals,

(4) contains an independent outpulsing time base device, or clock, synchronized with the beginning of each operation cycle of the engine,

(5) serves to outpulse counting and reference pulses as received by an appropriate transducer or pulse generator connected thereto, and

(6) serves to outpulse digital signals derived from the engine-load input transducer;

(e) an address counter which is connected to said ignition circuit and which is incremented by its counting pulses and reset by its reference pulses so that the digital output of said address counter consists of address signals corresponding to the actual angular position of said crankshaft;

(f) a correction processor connected to said address counter for receiving said digital address signals and further connected to the ignition circuit's digital engine-load output whereby a digital camshaft correction signal is produced and output;

(g) a temporary storage buffer which is connected to and arranged to receive the digital output signal of the correction processor and which is further clocked by the ignition circuit via connection to the counting, or tooth, pulse output line of said ignition circuit in such a way as to release the stored camshaft correction signal toward the end of each engine operational cycle as given by said counting pulses;

(h) a delay memory connected to receive said output correction signal of the storage buffer and further connected to said independent clock output line of the ignition circuit whereby said correction signal is not released until the expiration of each engine operational period as determined by said independent time base; and

(i) an electromechanical servo-type camshaft control device including a digital-to-analog converter connected to the output of the delay memory and a camshaft-adjustment mechanism including means to first effect a feedback-sensed llinear adjustment motion and then a feedback-sensed angular adjustment motion according to the information provided in said digital camshaft correction signal.

4,481,913

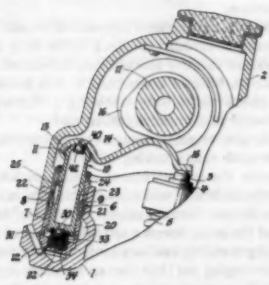
HYDRAULIC LASH ADJUSTER OIL METERING BALL VALVE

Rick C. Wirth, Alto, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 20, 1982, Ser. No. 451,006

Int. Cl.³ F01L *1/24*

U.S. Cl. 123—90.35 **2 Claims**



1. In a hydraulic lash adjuster including a cylindrical outer dashpot body, a hollow plunger telescopically received in said dashpot body with a free end thereof extending axially outward from said dashpot body, said free end having a semi-spherical reaction surface with a central axial passage extending therethrough, the improvement including a cup-shaped retainer fixed in said passage, said retainer having a base portion next adjacent to said reaction surface with a clover-leaf

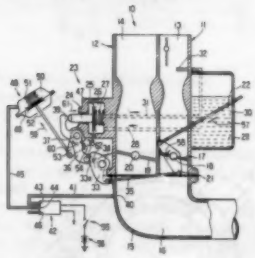
shaped aperture therein; and, a ball valve operatively supported in said retainer, said clover-leaf aperture including a generally circular portion of a mean diameter less than the outside diameter of said ball valve so as to define a seat for said ball valve and, a plurality of circumferentially spaced apart flutes extending radially outward of said circular portion said flutes being a predetermined cross-sectional area for the predetermined restricted flow of lubricant from said plunger when said ball valve is seated against said seat.

4,481,914

ACCELERATOR PUMP SYSTEM FOR CARBURETORS

Tokuzi Ishida, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 30, 1982, Ser. No. 430,065
Claims priority, application Japan, Dec. 7, 1981, 56-195565
Int. Cl.³ F02M 1/14
U.S. Cl. 123—179 G **5 Claims**



1. An accelerator pump system for an internal combustion engine, comprising:

(a) a two-barrel carburetor which comprises a primary intake passage for supplying an air-fuel mixture to the engine when the engine operates under a full range of loads, and a secondary intake passage for supplying an air-fuel mixture to the engine when the engine operates under relatively high loads, the primary intake passage having a primary throttle valve disposed therein;

(b) an accelerator pump actuable in response to opening of said primary throttle valve for supplying additional fuel into said primary intake passage, said accelerator pump having a housing mounted on said two-barrel carburetor;

(c) a throttle lever fixed to said primary throttle valve, a plate cam pivotally mounted on said two-barrel carburetor, a connector link operatively connected between said throttle lever and said plate cam, and a pump lever pivotally mounted on said housing for actuating said accelerator pump in response to movement of said plate cam; and

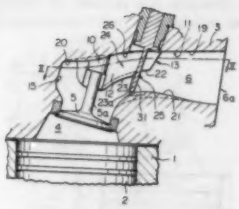
(d) means for actuating said accelerator pump in response to cranking of the engine, comprising a vacuum-operated actuator having a vacuum chamber, a diaphragm defining said vacuum chamber, an actuator link attached to said diaphragm, an actuator lever pivotally mounted on said housing and operatively connected to said actuator link, said actuator lever having a hook engageable with said pump lever, and a vacuum passage system for delivering a vacuum developed in response to cranking of the engine into said vacuum chamber, whereby said accelerator pump can be actuated by said actuator lever engaging said pump lever when said vacuum-operated actuator is actuated upon cranking of the engine.

4,481,915

HELICALLY-SHAPED INTAKE PORT OF AN INTERNAL COMBUSTION ENGINE

Kiyoshi Nakanishi; Takeshi Okumura; Mutsumi Kanda; Takeshi Kotani, all of Susono, and Tokuta Inoue, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 2, 1983, Ser. No. 490,321
Claims priority, application Japan, May 11, 1982, 57-077479
Int. Cl.³ F02F 1/42
U.S. Cl. 123—188 M **23 Claims**



1. An intake device of an internal combustion engine comprising:

an intake valve having a valve stem;

an axially extending intake port passage having an inlet opening at one end thereof and having an outlet opening at the other end thereof, said intake port passage having a substantially cylindrically extending circumferential wall which circumferentially extends about said valve stem, a first side wall which extends between said inlet opening and said circumferential wall along an axis of said intake port passage, a second side wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage and is arranged to face said first side wall, an upper wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage, and a bottom wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage;

a separating wall projecting downward from said upper wall and spaced from said bottom wall, said separating wall extending along the axis of said intake port passage and being spaced from said circumferential wall for defining a helical portion having a helix terminating portion between said separating wall and said circumferential wall, said separating wall being spaced from said first side wall for defining therebetween an inlet passage portion tangentially connected to said helical portion, said separating wall being spaced from said second side wall for defining therebetween a bypass passage which interconnecting said inlet passage portion to said helix terminating portion;

a normally closed valve means arranged in said bypass passage for controlling the flow area of said bypass passage;

an actuating means for actuating said valve means in response to the change in the operating condition of the engine to open said valve means when the engine is operating at a high speed under a heavy load; and

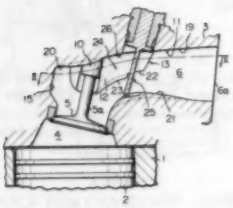
a rib projecting downward from a bottom face of said separating wall and extending toward said helical portion from said valve means.

4,481,916

HELICALLY-SHAPED INTAKE PORT OF AN INTERNAL COMBUSTION ENGINE

Kiyoshi Nakanishi; Takeshi Okumura; Mutsumi Kanda; Takeshi Kotani, all of Susono, and Tokuta Inoue, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 5, 1983, Ser. No. 491,770
Claims priority, application Japan, May 11, 1982, 57-077474; May 11, 1982, 57-077478
Int. Cl.³ F02F 1/42
U.S. Cl. 123—188 M 19 Claims



1. An intake device of an internal combustion engine comprising:

an intake valve having a valve stem;

an axially extending intake port passage having an inlet opening at one end thereof and having an outlet opening at the other end thereof, said intake port passage having a substantially cylindrically extending circumferential wall which circumferentially extends about said valve stem, a first side wall which extends between said inlet opening and said circumferential wall along an axis of said intake port passage, a second side wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage and is arranged to face said first side wall, an upper wall which extends between said inlet opening and said circumferential wall along the axis of said inake port passage, and a bottom wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage;

a separating wall projecting downward from said upper wall and spaced from said bottom wall, said separating wall extending along the axis of said intake port passage and being spaced from said circumferential wall for defining a helical portion having a helix terminating portion between said separating wall and said circumferential wall, said separating wall being spaced from said first side wall for defining therebetween an inlet passage portion tangentially connected to said helical portion, said separating wall being spaced from said second side wall for defining therebetween a bypass passage which interconnecting said inlet passage portion to said helix terminating portion;

a normally closed valve means arranged in said bypass passage for controlling the flow area of said bypass passage, said separating wall having a height which is equal to approximately half the height of said intake port passage in the vicinity of said valve means; and

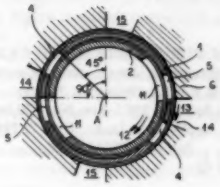
an actuating means for actuating said valve means in response to the change in the operating condition of the engine to open said valve means when the engine is operating at a high speed under a heavy load.

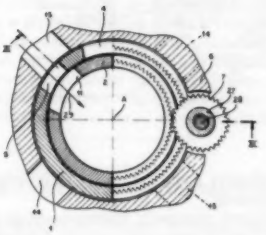
4,481,917

ROTARY VALVE FOR INTERNAL-COMBUSTION ENGINE

Harald Rus, Rosenberggürtel 35, 8010 Graz, and Georg Enzinger, Graz, both of Austria, assignors to Harald Rus, Graz, Austria

Filed Aug. 18, 1983, Ser. No. 524,296
Claims priority, application Austria, Aug. 18, 1982, 3128/82
Int. Cl.³ F01L 7/04
U.S. Cl. 123—190 C 16 Claims





1. In an internal-combustion engine having a piston cylinder with a cylinder head operable in a multistroke cycle,

the combustion therewith of a rotary valve driven by the engine and located in said cylinder head, said rotary valve comprising a first and a second annular shutter coaxially corotating in close contact with each other and having each two mutually opposite solid quadrants and two perforated intervening quadrants, said first shutter being synchronized with a reciprocating piston in said cylinder to perform half a revolution per cycle and being provided in the intervening quadrants thereof with first apertures registering with a pair of diametrically opposite outlet ports in said cylinder head during an exhaust phase and with a pair of diametrically opposite inlet ports in said cylinder head during an immediately following intake phase of the piston, said second shutter being synchronized with said piston to perform a full revolution per cycle and being provided in the intervening quadrants thereof with second apertures registering with said outlet and inlet ports during said exhaust and intake phases, respectively, said inlet ports communicating with a source of fuel/air mixture and being offset by 90° from said outlet ports, said inlet and outlet ports being obstructed during a compression/ignition phase and during a subsequent expansion phase by the solid quadrants of at least one of said shutters.

4,481,918
MEANS FOR REDUCING VIBRATION IN RECIPROCATING ENGINES

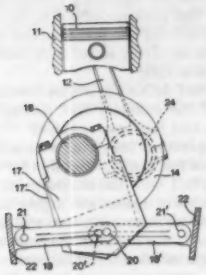
Paul G. Morton, Wightwick, England, assignor to Triumph Motorcycles (Meriden) Limited, Allesley, England

Filed Sep. 24, 1982, Ser. No. 422,681

Claims priority, application United Kingdom, Oct. 15, 1981, 8131076

Int. Cl.³ F16F *15/28*

U.S. Cl. 123—192 B **6 Claims**



1. A reciprocating engine comprising,

at least one piston,

a connecting rod connected at one end to the piston,

a crankshaft,

first crank pin means for rotatably supporting the connecting rod on the crankshaft about an axis displaced from the crankshaft axis,

balancing links constituting balancing weights, and second crankpin means for rotatably supporting the balancing links on the crankshaft and displaced from the crankshaft axis

the second crankpin means being located at 180° out of phase with the first crankpin means whereby the balancing links follow a path generally normal to the axis of the crankshaft and in opposition to the movement of the piston,

wherein the balancing links include at least two balancing links supported on the second crankpin means, and a guide link for each balancing link, the guide links extending in opposite directions to one another for attachment to points fixed in relation to the engine crankcase whereby the balancing links move in opposite directions about the associated second crankpin means during rotation of the crankshaft.

4,481,919
INTAKE/EXHAUST VALVE ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

Shoichi Honda, Tokyo, and Nobuo Anno, Urawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1982, Ser. No. 447,159

Claims priority, application Japan, Dec. 7, 1981, 56-196634; Dec. 7, 1981, 56-196635

Int. Cl.³ F02D *13/06*

U.S. Cl. 123—198 F **6 Claims**

1. An intake/exhaust valve assembly for an internal combustion engine including a crankshaft, a power cylinder, inlet and exhaust ports communicated to the power cylinder, comprising:

a reciprocating valve having a valve stem and a valve head placed at a position at which the inlet/exhaust port opens into the power cylinder, to open and close the inlet/exhaust port in accordance with an axial movement thereof;

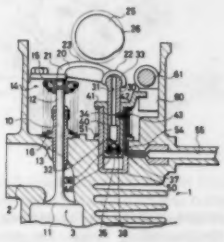
a camshaft driven by the crankshaft, having a cam surface formed on the circumferential surface thereof;

a cam follower having a first portion associated with an end of said valve stem, a second portion which forms a support point thereof, and a bearing surface contactable with said cam surface of the camshaft, said cam follower being adapted to translate a rotational movement of the reciprocating valve so as to open and close the inlet/exhaust port in accordance with the rotation of said camshaft when said cam follower is made operative; and

a support means comprising:

a cylindrical support member including a support end for supporting said second end of said cam follower, said cylindrical support member having at least one protrusion projecting at substantially a right angle to a longitudinal axis thereof;

a retainer member for slidably and rotatably receiving said cylindrical support member, said retainer member having



an opening portion for receiving said protrusion of the cylindrical support member, said cylindrical support member being axially slidable in said retainer member between predetermined first and second positions in which said cam follower is made operative and inoperative respectively;

a spring member for applying a biasing force on said cylindrical support member for urging the same to said first position; and

a positionning member associated with said protrusion of said cylindrical support member for displacing said cylindrical support member along a longitudinal axis thereof between said first and second positions and holding said cylindrical support member at said second position against said biasing force, whereby maintaining said intake/exhaust valve inoperative.

4,481,920
ROTARY INTERNAL COMBUSTION ENGINE, FLUID MOTOR AND FLUID PUMP HAVING PLANETATING GEAR PISTONS

William J. Carr, San Jose, and Wallace B. Carr, Fair Oaks, both of Calif., assignors to PDT Development & Marketing, San Jose, Calif.

Filed Sep. 28, 1982, Ser. No. 427,745

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—246 **19 Claims**

1. A rotary engine/pump for fluid pumps, fluid motors, combustion engines and the like comprising:

reactor lobe means defining an interior cavity having a plurality of radially arranged inwardly projecting convex reactor lobes;

an exhaust-intake rotor having a shaft extending therethrough journalled concentrically with the axis of, and within the reactor lobe means, said exhaust-intake rotor having convex lobes;

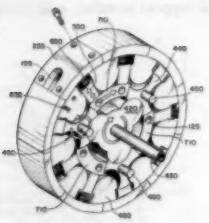
a multiplicity of secondary rotors each having a shaft extending therethrough, rotatably mounted equidistant from each other intermediate the convex lobes of the reactor lobe means and the exhaust-intake rotor with their shafts substantially parallel to the shaft of the exhaust-intake rotor, each of said secondary rotors having three radially

outwardly extending legs defining a concave cavity between each pair of said legs;

gear plate means adjacent one end of the reactor lobe means including:

plate means having one end of the shafts of said exhaust-intake rotor and said secondary rotors journalled therethrough; and

segment means extending from the plate means into the reactor lobe means intermediate the convex reactor lobes and the exhaust-intake rotor for separating said secondary rotors from each other and limiting the working areas of the engine/pump to substantially the cavities between each pair of legs of each secondary rotor; and



gear drive means coupled to the exhaust-intake rotor and each of the secondary rotors for providing rotational movement of the exhaust-intake rotor, the secondary rotors and the gear plate means with each of the secondary rotors rotating on its individual shaft in one direction and the entire assembly of the exhaust-intake rotor, the secondary rotors and the gear plate means rotating in the opposite direction;

said exhaust-intake rotor having as many lobes as there are secondary rotors and said reactor lobe means having three times as many reactor lobes as there are secondary rotors.

4,481,921

FUEL INJECTION APPARATUS OF INTERNAL COMBUSTION ENGINE

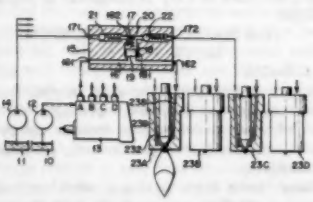
Kenji Tsukahara; Kouji Mutsukura, and Takayoshi Inoue, all of Aichi, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 19, 1983, Ser. No. 496,215

Claims priority, application Japan, May 26, 1982, 57-89352; May 26, 1982, 57-89353; May 26, 1982, 57-89354; May 26, 1982, 57-89355

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—304 **12 Claims**



1. A fuel injection apparatus for an internal combustion engine, for injecting different types of fuel into a combustion chamber of a cylinder in a given order, comprising:

(a) a nozzle housing having a fuel injection port and a needle valve disposed within said nozzle housing and movable along an axis thereof, said needle valve being tapered toward a distan end, which distal end is adapted to contact a correspondingly shaped portion of said nozzle housing to form a seat portion which closes the fuel injection port of the nozzle housing;

(b) resilient means for urging the needle valve in such a direction that said seat closes the fuel injection port of the nozzle housing;

(c) a fuel reservoir above and adjacent the seat portion and further extending upstream of said seat portion between an inner periphery of said nozzle housing and an outer periphery of said needle valve;

(d) a first fuel passage defined in the nozzle housing and opening at one end into said reservoir in a position remote from said seat for supplying a pressurized main fuel;

(e) a second fuel passage defined in the nozzle housing and opening at one end into said reservoir in a position close to said seat for supplying an auxiliary fuel to be used together with the main fuel;

(f) auxiliary fuel delivering means for delivering a specified amount of the auxiliary fuel through said second fuel passage to said fuel reservoir; and

(g) fuel compressing/delivering means for delivering pressurized main fuel through said first fuel passage to said fuel reservoir filled with the auxiliary fuel, to thereby move said needle valve against and urging force applied on said needle valve so as to move said seat from said fuel injection port and thus to inject the main and auxiliary liquid fuel through said fuel injection port.

4,481,922

INTAKE PORT STRUCTURE FOR INTERNAL COMBUSTION ENGINES

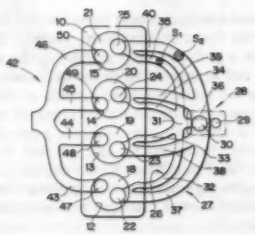
Yasuyuki Sugiura, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 30, 1982, Ser. No. 430,075

Claims priority, application Japan, Jan. 29, 1982, 57-11699

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—306 **2 Claims**



1. An intake port structure for an internal combustion engine having a plurality of cylinders each having a combustion chamber, comprising:

(a) two-barrel carburetor means including a primary passage with a primary throttle valve connected to a primary intake manifold assembly for supplying an air-fuel mixture into each of said combustion chambers in a full range of load conditions, and a secondary passage with a secondary throttle valve connected to a secondary intake manifold assembly for supplying an air-fuel mixture into each of said combustion chambers under relatively high load conditions;

(b) said primary intake manifold assembly being composed of a plurality of primary branch passage extending from a primary common pipe to intake ports defined in a cylinder head communicating respectively with said combustion chambers;

(c) said secondary intake manifold assembly being composed of a plurality of secondary branch passages extending from a secondary common pipe to said intake ports defined in said cylinder head communicating respectively with said combustion chambers;

(d) said primary branch passages and said secondary branch passages being respectively joined together immediately upstream of said intake ports, each of said primary branch passages terminating in an outlet which opens directly into a respective one of said secondary branch passages upstream of but closely adjacent the respective intake port;

(e) said cylinder head defining a surface which extends substantially perpendicularly with respect to the longitudinal axis of each of the respective combustion chambers, each of said primary branch passages having an end portion which terminates in said outlet and is oriented approximately in parallel relationship with said surface, said outlet of each of said primary branch passages being oriented substantially tangentially to the respective combustion chamber, each of said secondary branch passages terminating in an end portion which opens into the respective said combustion chamber in a direction which is transverse to said surface;

(f) a wall projecting sidewardly into the end portion of each of said secondary branch passages adjacent to a respective intake valve stem and adjacent to but downstream of the respective outlet for sidewardly deflecting an air-fuel mixture flowing from said primary and secondary branch passages for substantially tangential entry into said combustion chambers to form a circumferential flow of air-fuel mixture in the combustion chambers;

(g) each of said secondary branch passages having a groove extending from said outlet along an upstream side of said wall for guiding the air-fuel mixture flowing from the respective primary branch passage into the respective combustion chamber; and

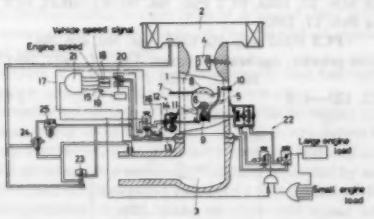
(h) said primary and secondary branch passages being dimensioned to meet the relationship of $(n-1)S_1 \leqq S_2$ where S_1 is the cross-sectional area of each of said primary branch passages, S_2 is the cross-sectional area of each of said secondary branch passages, and n is the number of said cylinders.

4,481,923

THROTTLE VALVE CONTROL APPARATUS IN INTERNAL COMBUSTION ENGINE

Syunzaburo Ozaki, Sakado, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,926
Claims priority, application Japan, Mar. 17, 1982, 57/41899
Int. Cl.³ F02M 3/04
U.S. Cl. 123—320 **2 Claims**



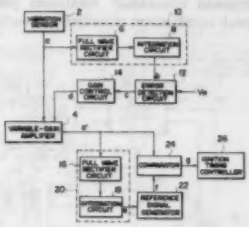
1. A throttle valve control apparatus in an internal combustion engine having a valve closing means for closing a throttle valve of an internal combustion engine beyond an idling position thereof, and the valve closing means being controlled in operation by a control means responsive to an engine speed and having an engine speed sensor, said valve closing means being operated at the time of deceleration from the condition that the engine speed is above a predetermined ON speed, and is released from operation when the engine speed is lowered to a predetermined OFF speed which is near an idling speed thereof, characterized in that the ON speed is set to be above the upper limit of an adjustment error range predetermined about the actual idling speed.

4,481,924

ENGINE KNOCK DETECTING APPARATUS

Tatsuo Kobayashi, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 9, 1983, Ser. No. 473,604
Claims priority, application Japan, Oct. 5, 1982, 57-174885
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 **17 Claims**



1. An engine knock detecting apparatus for sensing knocking occurring in an internal combustion engine comprising:

a vibration sensor for sensing vibration in said engine and for producing an electric signal corresponding to the vibration in said engine, said vibration having a vibration component caused by the knocking;

a variable-gain amplifier the gain of which is controllable, for producing an amplified output through an amplification of said electric signal in accordance with the controlled gain;

a first mean level detecting circuit for determining and outputting a first mean level signal which is the mean value of the level of said electric signal;

a gain controller for controlling the gain of said amplifier in accordance with the first mean level signal so as to maintain said amplified output at a level equal to or above a predetermined level;

a second mean level detecting circuit for determining and outputting a second mean level signal which is the mean value of said amplified signal;

a reference signal generator for producing and outputting a reference signal by adding a predetermined voltage to said second mean level signal; and

a comparator for outputting a knocking signal when the level of said amplified signal exceeds the level of said reference signal.

4,481,925

INTERNAL COMBUSTION ENGINE SPARK TIMING CONTROL INCLUDING PEAK COMBUSTION SENSOR

Philip A. Karau, Anderson; Marshall W. Littrell, Fortville, and John S. Brooks, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1983, Ser. No. 506,209
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 **1 Claim**

1. An internal combustion engine having a rotating crankshaft, a combustion chamber and means to initiate combustion in said combustion chamber, said engine comprising, in combination:

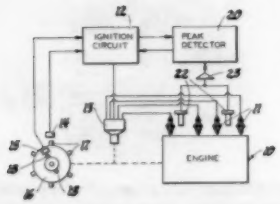
means effective to sense the consecutive pressure peaks in the combustion chamber and generate a continuous voltage analog signal thereof, said signal being subject to noise oscillations at a frequency higher than that of the consecutive pressure peaks, said oscillations producing a plurality of minor peaks from which the actual peak combustion pressure must be distinguished;

first storage means effective to track said voltage analog signal while said signal is increasing above any previous maximum and hold the maximum value thereof while said signal decreases;

means effective to sense the rotational position of the crankshaft at each instant at which the first storage means stops tracking the voltage analog signal; whereby the location of each peak higher than the last is detected;

second storage means effective when actuated to store sequentially numbers representing each successive value of the rotational position of the crankshaft as sensed by said last means;

means effective to actuate said second storage means for a predetermined crankshaft rotational position range in which peak combustion chamber pressure is expected and



reset said first storage means at the beginning of said predetermined crankshaft position range to a predetermined value sufficiently low as to allow peak combustion pressure to be detected; and

means effective to compare the value stored in the second storage means at the end of the predetermined crankshaft rotational position range with a predetermined reference and adjust a combustion affecting engine operating parameter in direction to reduce any significant difference between said value and said predetermined reference, whereby combustion is controlled to produce peak combustion chamber pressure at a predetermined crankshaft rotational position in closed loop control by sensing the location of peak combustion chamber pressure in the presence of high frequency noise peaks.

4,481,926

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Takao Miki; Yoshiaki Asayama, and Yoshiji Ueyama, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,143

Claims priority, application Japan, Aug. 11, 1981, 56-126978

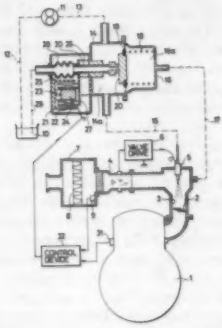
Int. Cl.³ F02M *39/00*

U.S. Cl. 123—463 **1 Claim**

1. A fuel injection system for an internal combustion engine comprising a fuel injection valve for injecting fuel under adjusted pressure into the intake pipe of an internal combustion engine, a vortex flow meter adapted to be connected to said intake pipe for generating an output signal at a frequency corresponding to the vortex velocity proportional to the flow rate of the intake air for said engine to thereby measure said intake air flow rate, injection valve drive means for opening said fuel injection valve for a predetermined period in synchronism with said output signal of said vortex flow meter to thereby effect fuel injection, pressure regulating means for holding substantially at a predetermined level the difference between the pressure of fuel being fed to said fuel injection valve and the pressure in said intake pipe into which the fuel is injected and control means for controlling said difference pressure in accordance with the running state of said engine;

wherein said pressure regulating means is comprised of a first pressure chamber having a fuel inlet adapted to be connected to a fuel pump, a fuel output connected to said fuel injection valve and a pressure relief output adapted to return fuel to a fuel tank, a second chamber adapted to be connected for fluid pressure communication with said intake pipe, spring biased moveable valve means separating said first and second chambers in operative association with said fuel relief outlet for controlling the fuel pressure in said first chamber;

wherein said control means is comprised of a hollow pipe extending into said first chamber in an airtight slidable manner to constitute said fuel relief outlet, temperature



sensing means for sensing an engine temperature and an intake air temperature to produce an output, and electromagnetic means for moving said pipe into and out of said first chamber in response to the output of said temperature sensing means for varying its position relative to said moveable valve means; and

wherein said electromagnetic means comprises a linearly moving electrical coil which is connected to said hollow pipe so that said pipe is moved in accordance with linear movements of said coil.

4,481,927

APPARATUS FOR SUPPLYING FUEL INTO AN INTERNAL COMBUSTION ENGINE

Takao Miki, and Yoshiaki Asayama, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

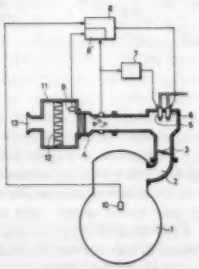
PCT No. PCT/JP82/00314, § 371 Date Mar. 22, 1983, § 102(e) Date Mar. 22, 1983, PCT Pub. No. WO83/00533, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 10, 1982, Ser. No. 486,284

Claims priority, application Japan, Aug. 11, 1981, 56-126968

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—478 **2 Claims**



1. An apparatus for supplying fuel into an internal combus-

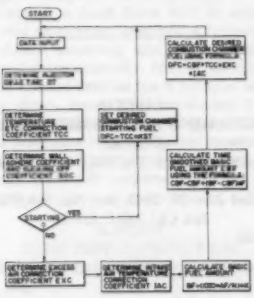
tion engine, comprising a vortex flow meter for detecting the quantity of air drawn into the engine, a first electromagnetic valve adapted to be driven for a predetermined length of time synchronously with the frequency output of said vortex flow meter to inject fuel, an operating unit for calculating an input corresponding to at least the frequency output of said vortex flow meter and temperature, and determining the quantity of fuel corresponding to the rotatory speed of the engine, and a second electromagnetic valve for injecting synchronously with the rotatory speed of the engine the quantity of fuel determined by said operating unit.

4,481,928

L-JETRONIC FUEL INJECTED ENGINE CONTROL DEVICE AND METHOD SMOOTHING AIR FLOW METER OVERSHOOT

Toshiyuki Takimoto; Keiji Aoki, and Shinichi Sugiyama, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 5, 1982, Ser. No. 375,219
Claims priority, application Japan, Jul. 6, 1981, 56-105339
Int. Cl.³ F02B 3/00
U.S. Cl. 123—492 **10 Claims**


START
DATA INPUT
CALCULATE DESIRED COMBUSTION CHAMBER FUEL AMOUNT FORMULA 3
DETERMINE INJECTION TIME
DETERMINE TEMPERATURE ETC. CORRECTION COEFFICIENT
SET DESIRED COMBUSTION CHAMBER STARTING FUEL
DETERMINE WALL WETTING COEFFICIENT AND FUEL AMOUNT ETC. USING TIME FORMULA 5
CALCULATE TIME SMOOTHED BASIC FUEL AMOUNT ETC USING TIME FORMULA 6
START?
YES
NO
DETERMINE EXCESS AIR CORRECTION COEFFICIENT
DETERMINE INTAKE AIR TEMPERATURE CORRECTION COEFFICIENT
CALCULATE BASIC FUEL AMOUNT

1. In an internal combustion engine comprising an intake manifold, a fuel injection valve fitted to said intake manifold and adapted to be selectively opened so as to inject fuel into said intake manifold by supply of an actuating signal thereto for a time duration corresponding to that of said actuating signal supplied, and an intake air flow meter of a type having a swingable flapper adapted to be swung by intake air flow for angles corresponding to flow rates of intake air, said intake air flow meter generating an intake air flow rate signal representative of intake air flow rate,

a method of controlling fuel injection by said fuel injection valve, comprising the repetitive steps of:

(a) sensing revolution of said engine with an engine revolution sensor so as to generate an engine revolution signal representative of revolutionary speed of said engine;

(b) determining at a sequence of instants separated by successive intervals successive values of a first quantity which is proportional to said intake air flow rate signal and inversely proportional to said engine revolution signal;

(c) determine at said sequence of instants a second quantity which is a sum of a value of said first quantity at an immediately preceding instant to a current instant of said sequence and a predetermined fraction of a difference between said current instant value of said first quantity and said value of said first quantity at said immediately preceding instant to said current instant; and

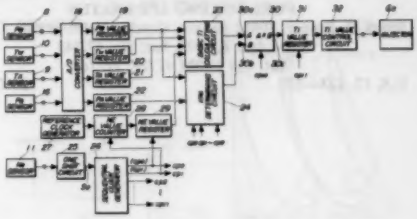
(d) generating said actuating signal to be supplied to said fuel injection valve according to said second quantity, each current rate of time duration in which said actuating signal is supplied to said fuel injection valve being substantially proportional to each current value of said second quantity.

4,481,929

METHOD AND DEVICE FOR ATMOSPHERIC PRESSURE-DEPENDENT CORRECTION OF AIR/FUEL RATIO FOR INTERNAL COMBUSTION ENGINES

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,404
Claims priority, application Japan, Nov. 12, 1981, 56-181486
Int. Cl.³ F02B 3/00
U.S. Cl. 123—494 **7 Claims**



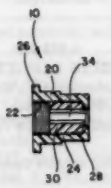
1. A method for correcting the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine having an intake pipe, and a throttle valve arranged in said intake pipe, comprising: detecting a value of at least one parameter indicative of the operating condition of said engine; determining a value of the air/fuel ratio of said air/fuel mixture in accordance with the detected value of said at least one parameter; detecting a value of absolute pressure of the atmosphere encompassing said engine; detecting a value of absolute pressure in said intake pipe at a location downstream of said throttle valve; determining a value of a coefficient for correction of said determined value of the air/fuel ratio, as a function of the detected values of said atmospheric absolute pressure and said intake pipe absolute pressure; and correcting the determined value of the air/fuel ratio by an amount corresponding to the determined value of said correction coefficient.

4,481,930

FUEL INLET REPAIR DEVICE

Joseph D. Chadwick, 2327 English Ave., Indianapolis, Ind. 46201

Filed Feb. 22, 1983, Ser. No. 468,310
Int. Cl.³ F16L 5/00
U.S. Cl. 123—495 **5 Claims**



1. A fuel inlet device for repairing damaged threaded fuel inlet openings of an engine carburetor or fuel injection pump comprising a generally tubular shaped outer member formed of a pliable fuel impervious material, said tubular shaped outer member having a tapered opening longitudinally therethrough; an inner tubular shaped plug member having an outer diameter corresponding generally to the mean diameter of the tapered opening in the outer member, said inner tubualr shaped

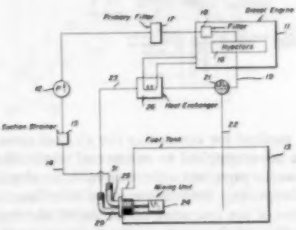
member having an opening longitudinally therethrough; said inner tubular member having means for engaging the surface of the tapered bore of said outer tubular shaped member and causing said tubular shaped outer member to expand radially outwardly when said inner tubular member is forced into said tapered bore to cause the outer surface of said tapered bore to cause the outer surface of said outer tubular member to contact the bore of a fuel inlet opening of an engine carburetor or fuel injection pump and form a fluid tight seal; and means for connecting a fuel inlet line to the tapered bore of said outer tubular member, whereby a fluid tight connection is made between a fuel inlet line and an engine carburetor or fuel injection pump.

4,481,931

FUEL MIXING APPARATUS

Frank D. Bruner, 10012 Emmet, Omaha, Nebr. 68134

Filed Jun. 8, 1979, Ser. No. 47,343
Int. Cl.³ F02M *37/20, 31/16*
U.S. Cl. 123—557 **20 Claims**



1. A fuel mixing unit useful when submerged in a stored body of fuel to combine fuel from that body with warmer fuel returning from a fuel injector to create a supply flow which is resistant to waxing, the unit comprising

a. a return conduit for admitting said return flow and an outlet conduit for discharging said supply flow;

b. means defining a flow path leading from the outlet conduit to the exterior of the unit through which fuel in said body may flow to the outlet conduit; and

c. flow dividing and directing means for delivering to the outlet conduit a controlled portion of the return flow admitted by the return conduit which depends upon the rate of that flow,

the dividing and directing means being effective at a predetermined low flow rate to direct substantially the entire return flow to the outlet conduit, and being effective at a predetermined higher flow rate to direct only a selected portion of the return flow to the outlet conduit and to discharge the remainder of the return flow into the body in which the unit is submerged.

4,481,932

DOUBLES TARGET TRAP

Scott M. Olson, 108 Lakeview Cir., Buffalo, Minn. 55313

Filed Sep. 30, 1982, Ser. No. 431,618
Int. Cl.³ F41B *7/00*
U.S. Cl. 124—8 **12 Claims**

1. A trap for throwing targets comprising:

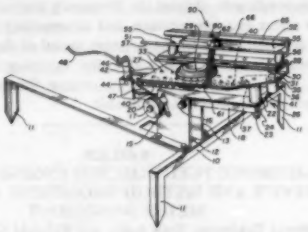
a frame;

an upstanding shaft supported for rotation upon said frame;

a first target throwing arm mounted adjacent one end on said shaft, with its longitudinal axis projecting laterally of said shaft axis, said arm defining a leading and trailing edge;

power means on said frame and operably joined to said first throwing arm to swing the arm and launch targets therefrom;

a second target throwing arm positioned generally above the first throwing arm and having a leading and trailing edge, hinge means for hingedly connecting the two arms, said trailing edge of one of said arms being hingedly mounted by said hinge means to the other of said arm along its trailing edge and at least two points adjacent opposite ends of said arms, said arms having target support portions, the hinge means permitting the angle formed by the planes of said target support portions to be varied, and



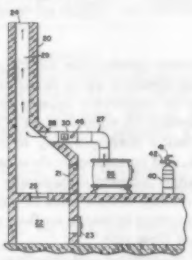
means to vary the angle between said planes of the target support portions, whereby the vertical component of trajectory of at least one projectile may be varied.

4,481,933

FIRE EXTINGUISHING ATTACHMENT FOR CHIMNEY STACKS

Kenneth Sawtelle, Hemlock Dr. (Box 39), Fitzwilliam, N.H. 03447

Filed Jun. 29, 1983, Ser. No. 508,850
Int. Cl.³ A62C *31/00*
U.S. Cl. 126—58 **2 Claims**



1. In combination with a powder fire extinguisher, having a nozzle, and a wood burning stove having a stove stack leading past a damper to a chimney flue:

a fire extinguishing attachment comprising;

a section of a stove stack having a curved side wall with a hole therein;

a curved plate, sealingly covering said hole and affixed on said stack beyond said damper proximate said chimney flue;

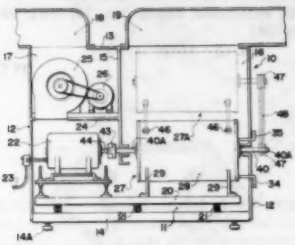
a tubular guide of right angular configuration affixed in said curved plate and passing through said hole;

said tubular guide having one end outside said stack for receiving a powdered fire extinguishing material from said nozzle and having the other end extending in the direction of gas flow inside said stack to direct said powder material in the direction of, and up, said chimney, in an unobstructed path without obstructing normal chimney draught.

4,481,934
FRICTION FURNACE

Douglas D. Stephenson, Site #3, Box 29, R.R. #1, Regina, Saskatchewan, Canada (S4P 2Z1)

Filed Feb. 2, 1983, Ser. No. 463,148
Claims priority, application United Kingdom, Feb. 4, 1982, 8203183
Int. Cl.³ F24C 9/00
U.S. Cl. 126—247 15 Claims

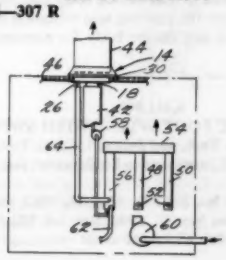


1. A heat generating device comprising in combination a supporting structure, a fixed drum with its axis horizontally supported in said supporting structure, a horizontally located rotor drum, means mounting said rotor drum for rotation within said fixed drum coaxially, relative thereto so as to define, a coaxially located annular space between said fixed drum and said rotor drum, means for introducing a viscous fluid between said drums to develop heat from the relative rotation, and an electric resistance heating element mounted adjacent to said stationary drum and operatively connected to a source of electrical energy to provide supplementary heat to said device.

4,481,935
FLUE PIPE CONNECTION

Fred Bawel, Boonville, Ind., assignor to Arkla Industries, Inc., Evansville, Ind.

Filed Dec. 15, 1982, Ser. No. 449,879
Int. Cl.³ F23J 11/00
U.S. Cl. 126—307 R 4 Claims

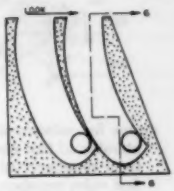


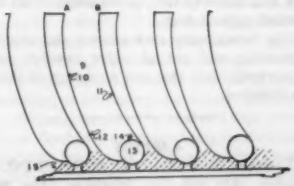
4. In combination with a fuel-fired recuperative furnace having a non-fired recuperative heat exchanger cell and a condensate drain tube leading from said cell; a flue gas system for venting flue gas containing condensible vapors resulting from the combustion of a fuel, said system comprising an upper external flue gas conduit; a lower flue gas conduit within the furnace and connected to said recuperative heat exchanger cell; means forming a connection between the conduits such that flue gas can pass from the lower conduit into the upper conduit; and means including a generally annular wall cooperating with the inner surface of one of said conduits to form a generally annular trough which is located to receive any condensate formed on and flowing down the inner surface of the upper conduit, the trough including at least one drain passage for draining condensate by gravity from the trough in a generally radially outward direction; and conduit means for merging condensate from said drain passage with condensate from said recuperative heat exchanger cell, said conduit means having an upper end connected to said condensate drain passage of said trough and having a lower end in communication with said drain tube which leads from said recuperative heat exchanger.

4,481,936
SOLAR ENERGY COLLECTOR

Howard D. Gregory, 416 Tracy Cir., Nokomis, Fla. 33555

Continuation of Ser. No. 329,599, Dec. 10, 1981, abandoned, which is a continuation of Ser. No. 173,990, Jul. 31, 1981, abandoned. This application Jan. 6, 1984, Ser. No. 568,524
Int. Cl.³ F24J 3/02
U.S. Cl. 126—439 2 Claims





1. A solar collector, comprising:
a deep chamber defined by cooperating first and second arcuate sidewalls united at the chamber bottom by a parabolic wall;
the first arcuate wall being concave and the second arcuate wall being convex;
the chamber has an open top inception area in a plane from which the arcuate sidewalls depend for receiving solar radiation;
the shortest distance between the convex and concave sidewalls of the deep chamber diverges progressively as the distance from said plane increases;
a transducer located near the chamber bottom to absorb said solar radiation;
the convex, concave and parabolic walls all being reflective.

4,481,937
SEQUENTIAL COMPRESSION DEVICE

Edward J. Arkans, Hoffman Estates, Ill., assignor to The Kendall Company, Walpole, Mass.

Division of Ser. No. 164,137, Jun. 30, 1980, Pat. No. 4,396,010. This application Jul. 2, 1981, Ser. No. 279,793
Int. Cl.³ A61H 1/00
U.S. Cl. 128—24 R 11 Claims

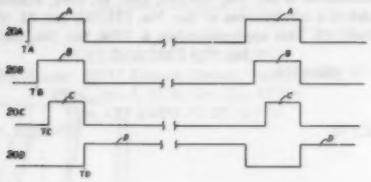
1. In a pressure generating device for applying compressive forces against a patient's limb through means of a flexible sleeve connectable therewith and enclosing the limb, said sleeve having a plurality of closed pressure chambers and a ventilation chamber with a plurality of openings facing the limb when enclosed therein, the improvement comprising:
a source of pressurizable fluid;
a plurality of first valve members connected between the

source and the plurality of pressure chambers, respectively;

a second valve member connected between the source and the ventilation chamber; and

means connected with the valve members for electronically controlling them to periodically apply pressure to said chambers said electronic controlling means including

means for successively generating a plurality of first electrical actuation signals for actuating said plurality of first valve members to successively pressurize said plurality of pressure chambers, respectively,



means for substantially simultaneously terminating said plurality of first electrical actuation signals to substantially simultaneously deactuate all of said plurality of first valve members,

means for generating a second actuation signal for actuating said second valve member to couple said source of pressurizable fluid to the ventilation chamber substantially concurrently with termination of all of said first actuation signals, and

means for terminating said second actuation signal for deactuating said second valve member substantially concurrently with the next actuation of the first pressure chamber.

4,481,938

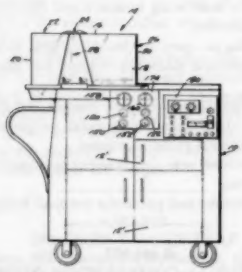
RESUSCITATOR, RESPIRATOR AND/OR INCUBATOR

John E. Lindley, 1410 20th Ave., Meridian, Miss. 39301

Filed Oct. 16, 1981, Ser. No. 312,322

Int. Cl.³ A61H *31/02*

U.S. Cl. 128—30 **20 Claims**



1. A resuscitator comprising:

means defining a pressure chamber divided by a partition into separate gas-tight head and body compartments with said partition having a neck-receiving opening therein provided with neck-engaging sealing means; and

means for automatically admitting an oxygen-containing breathable gas from a source thereof independent of the gas in said compartments alternately to one of said compartments under a predetermined positive pressure while simultaneously creating a predetermined negative pressure in the other of said compartments to withdraw and discharge to atmosphere the gas therein with the time interval of each of said alternate admissions and negative pressure creations being predetermined to thereby perform respiratory cycles for a patient in the chamber with the duration of the inspiratory portion and of the expiratory portion of each cycle being predetermined.

4,481,939

BEAUTY TREATMENT DEVICE

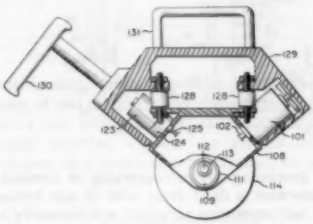
Kenichi Mabuchi, Matsudo, Japan, assignor to Bio Mabuchi Co., Ltd., Japan

Filed Jan. 7, 1982, Ser. No. 337,653

Claims priority, application Japan, Jan. 16, 1981, 56-5648; Jan. 21, 1981, 56-7541

Int. Cl.³ A61H *15/00*

U.S. Cl. 128—57 **19 Claims**



1. A beauty treatment device comprising:

a device body;

at least one vibration gear and means for rotatably mounting said gear to said body, said gear having an eccentrically located shaft hole therethrough;

a wheel shaft rotatably mounted in said shaft hole in said vibration gear for movement in an orbital path with rotation of said vibration gear;

a plurality of sharp-edged disc-like wheels connected to said wheel shaft for rotation and orbital movement with rotation and orbital movement of said wheel shaft, said wheels adapted to be depressed onto a skin surface and adapted to roll on the skin surface with rotation of said wheels;

drive means mounted in said device body and connected to said vibration gear for rotating said vibration gear; and

a weight resting on said device body for exerting force on said wheels.

4,481,940

ORTHOPEDIC FOOT SPLINT WITH SWIVEL

Robert J. Kurtz, New York, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Continuation of Ser. No. 358,531, Mar. 16, 1982, abandoned. This application Sep. 13, 1983, Ser. No. 531,583

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 A **13 Claims**

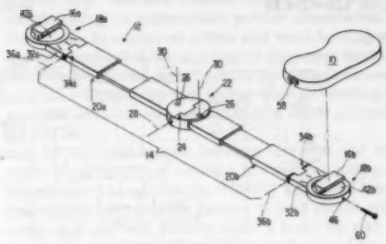
1. An orthopedic foot splint which is attached to the shoes of a user comprising:

a pair of shoe engaging plates, each said plate having a longitudinal axis approximately parallel to the longitudinal axis of the shoe which is attachable thereto;

an elongate connecting means for horizontally interconnecting said pair of shoe engaging plates, said connecting means including two elongate sections, one end of each said elongate section being connected to a respective shoe engaging plate, longitudinal pivot means comprising the connection between at least one elongate section and shoe engaging plate, a central joint means including a longitudinal hinge to permit said sections to move with respect to each other in a plane perpendicular to the axis of said hinge, said central joint means further including pivot means for permitting angular movement of one of said elongate sections with respect to the other elongate sec-

tion on an axis vertically disposed with respect to the axis of said longitudinal hinge,

swivel means provided between said connecting means and at least one of said shoe engaging plates for allowing said shoe engaging plate to swivel about a vertical axis with respect to said connecting means, said swivel means including a stop means for selectively restricting the movement of said swivel means such that the toe or heel of the respective shoe can only swivel toward or away from said connecting means from an initial position where the longitudinal axis of said shoe engaging plate is approximately perpendicular to said longitudinal axis of said connecting means.

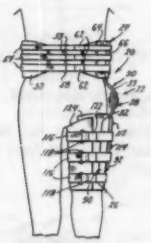


4,481,941

UNIVERSAL HIP STABILIZATION DEVICE

Thomas A. Rolfes, 1823 Enola Ct., St. Louis, Mo. 63122

Filed Mar. 7, 1983, Ser. No. 472,921
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—87 R **16 Claims**



1. A device for stabilizing the hip of a patient who has a broken bone in the leg or hip or has a dislocated hip, but who retains control of the muscles in the leg and hip, the device interacting with the muscles of the leg and hip to permit the patient to voluntarily move his leg to various positions, comprising:

(a) a brace for mounting in alignment with the patient's hip; said brace having an upper extension and a lower extension, and means for pivotally connecting the lower extension to the upper extension;

(b) noninflatable waist engaging means for adjustably engaging the patient's waist, and noninflatable means for adjustably engaging the upper extension to the waist engaging means so that the device can be adjusted to patients of varying heights and proportions;

(c) noninflatable thigh engagement means for adjustably engaging the patient's thigh comprising a rigid support, and noninflatable means for adjustably engaging the bottom of the lower extension to the thigh engagement means so that the device can be adjusted to patients of varying heights and proportions, so that the brace is held generally in alignment with the hip joint to allow the patient to use the muscles in his leg and hips to pivot the lower extension with respect to the upper extension in the same direction as the flexion of the hip; and

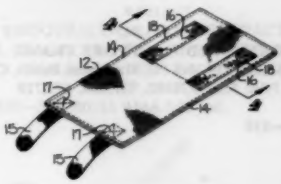
(d) further comprising means for adjustably selectively limiting the pivoting of the lower extension with respect to the upper extension so that different degrees of pivoting of the two extensions to each other are provided.

4,481,942

INFANT ARM RESTRAINT

Thomas A. Duncan, 155 Enwood Dr., Charlotte, N.C. 28214

Filed Sep. 4, 1979, Ser. No. 72,157
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—133 **2 Claims**



1. An arm restraint for application around the elbow of an infant and constructed so as to completely surround the arm of the infant at the elbow and to prevent the arm from bending at the elbow so as to thereby keep the infant's hands away from certain areas, as for example his face, following facial surgery, said arm restraint being characterized by ease of application to the infant's arm, by being comfortable and nonirritating to the tender skin of the infant, and by being capable of withstanding repeated laundering or sterilizing operations, said arm restraint comprising a stiffening member formed of a thin sheet material having sufficient flexibility to permit being formed into a cylindrical configuration but having sufficient stiffness so as to resist bending in a direction perpendicular to the axis of the cylindrical configuration, said sheet material comprising a nonporous plastic material capable of withstanding the temperature of washing, drying or sterilizing without degradation or without damage to the plastic material and without taking a permanent set, and said stiffening member being of a generally rectangular configuration having a length dimension greater than its width dimension, the width dimension being less than the distance between the wrist and the armpit of an infant, and the length dimension being greater than the circumference of the arm of an infant, the width and length dimensions of the stiffening member thus enabling the stiffening member to be formed into a generally cylindrical configuration about an axis parallel to the width dimension to encircle and completely surround the arm of the infant at the elbow and with opposite ends of the stiffening member overlapping to thereby prevent bending of the arm at the elbow, and with the stiffening member extending a short distance on opposite sides of the elbow but not so far as the wrist or armpit to thus avoid discomfort and irritation of the infant, a washable fabric covering extending over opposite surfaces of said stiffening member and enclosing the stiffening member therein and presenting a soft, clean, washable surface for contacting the arm of the infant, said fabric covering being formed of hygroscopic fibers so as to be readily absorbent and to assist in wicking any moisture away from the skin of the infant to prevent irritation, at least one row of stitching extending through the fabric covering and the underlying stiffening member adjacent the periphery of the arm restraint for permanently securing the fabric covering to the underlying stiffening member, at least one elongate strip of hook and loop fastener material positioned adjacent one longitudinal end of the arm restraint and extending longitudinally therebeyond, and including stitching extending through said strip and through the underlying fabric covering and stiffening member for securing

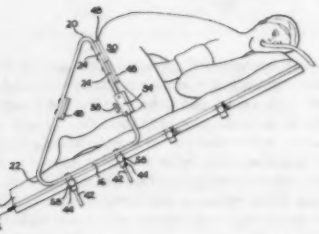
said strip to the arm restraint, and at least one strip of complementary hook and loop fastener material positioned on the outer surface of the arm restraint medially of opposite ends thereof and extending in a longitudinal direction and positioned for cooperating with said other strip of fastening material for securing the arm restraint in a generally cylindrical configuration about the arm of an infant with opposite ends of the arm restraint overlapping one another.

4,481,943

ORTHOPEDIC SUPPORT FRAME

Gary K. Michelson, 117 38th Pl., Manhattan Beach, Calif. 90266

Filed Mar. 9, 1983, Ser. No. 473,710
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—134 **10 Claims**



1. An orthopedic support frame for supporting a patient prior to and during surgery on an operating table having side rails and rail clamps disposed along said side rails, said frame containing brackets, comprising:

(a) first and second bracket members each comprising first and second frame members, each affixed at substantially right angles to each other, and a third frame member affixed to said first second frame members so that each of said first and second bracket members has a substantially triangular shape, said first and second bracket members being parallel set apart in parallel relationship;

(b) at least one posterior support means extending at least from said first bracket member to said second bracket member and being rigidly affixed to the upper portion of said first and second bracket members for supporting the posterior of the patient,

(c) locking member movably mounted upon said first frame members of said first and second brackets members below said posterior support means, said locking member being capable of being fixed at any position on said first members between said posterior support means and said second frame members,

mounting means extending downward from said second frame members of said first and second bracket members for mounting the frame to the operating table, said mounting means being capable of being inserted through said rail clamps on said side rails, at preselected depths;

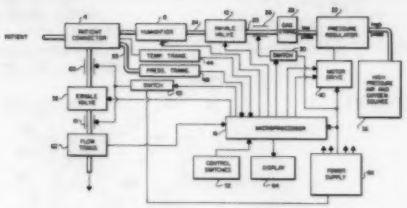
whereby said locking member may be locked in position against rear of the patient's knee joints to fix said patient to said table such that when the operating table is rotated in a reverse Trendelenberg position, the patient's body moves into and remains a sitting position on said posterior support means such that the patient is in the optimal knee-chest position for orthopedic surgery.

4,481,944

APPARATUS AND METHOD FOR ASSISTING RESPIRATION

J. Bert Bunnell, Salt Lake City, Utah, assignor to Bunnell Life Systems, Inc., Salt Lake City, Utah

Filed Nov. 19, 1981, Ser. No. 322,742
Int. Cl.³ A61B *7/00*
U.S. Cl. 128—204.18 **30 Claims**



1. Apparatus for assisting a person's respiration by supplying gas pulses to the person's respiratory system where the frequency of the pulses is varied over a range which includes the resos pulses to the person's respiratory system where the frequency of the pulses is varied over a range which includes the resonant frequency of the person's respiratory system, said apparatus comprising

means for producing a series of gas pressure pulses,

means for automatically varying the frequency of occurrence of the pulses to repetitively sweep over a selected range which includes the resonant frequency of the person's respiratory system, and

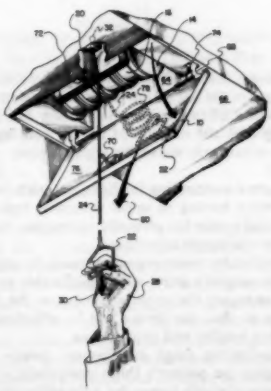
means for supplying the pulses to the person's respiratory system.

4,481,945

DEPLOYMENT SYSTEM FOR EMERGENCY OXYGEN MASK

Harold H. Levine, Northridge, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Feb. 10, 1983, Ser. No. 465,405
Int. Cl.³ A62B *7/00, 7/14*
U.S. Cl. 128—206.27 **3 Claims**



1. A mask deployment subsystem for use with a supplemental oxygen system aboard an aircraft, said deployment subsystem comprising:

an oxygen mask;

means for holding said mask in a stowed position including a frame structure defining an opening with opposite side portions whereby said holding means is adapted to hold said mask within said frame structure inside said opening;

a flexible sheath having a first edge fixed to said frame structure adjacent one side portion thereof and an opposite second edge movable relative to said first edge, said sheath having an intermediate portion dimensioned such that it may be contained within said mask holding means and positioned such that it is draped about said mask when said mask is inside said frame structure in said stowed position with said opposite second edge terminating adjacent said opposite side portion of said frame structure;

a handle; and

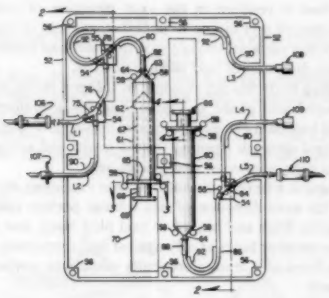
means for applying tension between said first and second edges of said sheath in response to a manual pulling force being applied to said handle, whereby when said handle is pulled, said intermediate portion of said sheath will become taut and will thereby exert a force on said mask tending to displace said mask from said stowed position.

4,481,946

BONE MARROW TRANSPLANT METHOD AND APPARATUS

John H. Altshuler, 5700 Dunbarton Dr., Englewood, Colo. 80110, and Dean T. Farrish, 6620 Trailway Cir., Parker, Colo. 80134

Filed Aug. 14, 1980, Ser. No. 177,875
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—4 **13 Claims**



1. In bone marrow transplant apparatus wherein a pair of aspiration needles are insertable into the bone of a mammal in closely-spaced relation to one another, one of said aspiration needles being connectable to a bone marrow collector and the other of said aspiration needles being connectable to an intravenous solution source, the combination therewith comprising:

a first chamber interposed between said one aspiration needle and said bone marrow collector to normally establish fluid communication therebetween;

a second chamber interposed between said second aspiration needle and said intravenous solution source to normally establish fluid communication therebetween;

fluid flow control means associated with said first and second chambers to regulate the pressure level within each of said chambers such that the pressure level in said first chamber is variable between a negative pressure to induce the removal of bone marrow from the bone marrow site into said chamber and a positive pressure level operative to force the bone marrow recovered into said bone marrow collector and the pressure level in said second chamber being variable between a negative pressure level to induce the flow of intravenous solution from said intravenous solution source into said second chamber and a positive pressure level to cause said intravenous solution to flow from said second chamber through said second aspiration needle into the bone marrow site; and

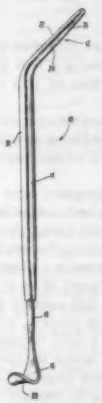
valve means associated with said fluid flow control means being selectively movable between open and closed positions to regulate the flow of fluid and materials to and from said first and second chambers.

4,481,947

ENDOTRACHEAL TUBE RETRACTOR

Martin H. Chester, 25310 Tierra Grande, Carmel, Calif. 93923

Filed Feb. 14, 1980, Ser. No. 121,620
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—303 R **3 Claims**



1. An endotracheal tube retractor comprising:

(a) a lower blade portion having a scoop-like portion for engagement with an endotracheal tube, said blade being formed with smooth, blunt edges and having a wider portion at the bottom thereof, said bottom being formed with concave curvature,

(b) a middle portion connected to said blade at the upper end thereof, said middle portion being of generally cylindrical shape and tapering downwardly toward said blade portion,

(c) a handle portion connected at the lower end thereof to the upper end of said middle portion, said handle portion being oriented at an acute angle with respect to the longitudinal axis of said middle portion, said handle and said scoop-like portion of said blade extending away from said longitudinal axis of said middle portion in opposite directions, said handle portion being generally in the form of an elongated rectangular solid extending upwardly and away from said middle portion in a smooth continuous manner,

(d) said handle portion and a top section of said middle portion together forming a gripping portion engageable between several fingers of one hand, such that, when gripped, neither the fingers nor the hand extend substantially beyond a plane defined by a front face of said middle portion, and wherein said handle includes a stabilizing support comprising at least one flat surface adapted to lie substantially along the length of a finger of the user, thereby allowing precise manipulation of the retractor.

4,481,948

MEDICAL INSTRUMENT, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

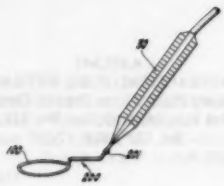
Gary M. Sole, 3973 Nearbrook Dr., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 221,065, Dec. 29, 1980, Pat. No. 4,367,744. This application Jul. 1, 1982, Ser. No. 394,409

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.14 **15 Claims**



1. A medical instrument, comprising:

cautery means for burning a lens capsule of an eye at the periphery of a portion of said capsule to be removed during surgery;

said cautery means comprising a cautery portion formed of a fine wire and shaped so as to correspond to a peripheral extent of said portion of said capsule to be removed;

a handle portion;

a substantially rigid elongated stem portion extending from said cautery portion and connected with said handle portion, said stem portion being electrically-conductive and covered with an electrically-insulative material;

said cautery portion having a dimension corresponding to the diameter of the pupil of an eye to be operated upon;

means for connecting said cautery portion, via said electrically-conductive stem portion, with an electrical apparatus which generates a radio frequency current supply; and

said cautery portion, when supplied with said radio frequency current, being adapted to become heated when said cautery portion is brought into contact with said peripheral extent of said portion of said capsule to be removed, whereby said peripheral extent of said capsule portion to be removed is seared by said cautery portion.

4,481,949

PACIFIER

Lutz Kesselring, and Horst Frödrich, both of Zeven, Fed. Rep. of Germany, assignors to MAPA GmbH Gummi-und Plastikwerke, Zeven, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 351,910

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108094

Int. Cl.³ A61J *17/00*

U.S. Cl. 128—360 **18 Claims**

1. In a pacifier comprising

a guard having a first side and an oppositely directed second side with a through opening extending from the first side to the second side and with protruding supporting means spaced around said opening on said second side and extending outwardly from said second side in an axial direction of said through opening,

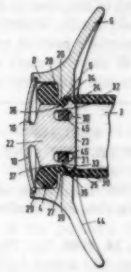
an elastic nipple having a tubular portion, which extends through said opening, and a mouthpiece which is integral with said tubular portion and disposed on and spaced outwardly from the first side of said guard, said tubular portion having an axis extending generally parallel to the axis of said through opening, and

a plug comprising a plug body and a base connected to said plug body and disposed on said second side of said guard and bearing on said supporting means, said plug body extending into said opening in said guard and being surrounded for a part of its length by said tubular portion, said plug body and said opening in said guard each having facing abutment surfaces including inclined surfaces,

the improvement resided in that

said guard comprises first inclined surfaces disposed on the outside of said tubular portion and facing said base, said first inclined surfaces being inclined relative to the axis of said through opening and tubular portion,

said plug is formed with second inclined surfaces disposed on the inside of said tubular portion and facing said first inclined surfaces, said second inclined surfaces being inclined relative to the axes of said through opening and tubular portion,



said base is resilient in the axial direction of said tubular portion of said nipple to permit movement of said second inclined surfaces toward said first inclined surfaces in the axial direction of said tubular portion,

said plug body having projections thereon facing outwardly toward said guard so that during elastic deformation of said base said projections can be moved in the axial region of said through opening in said guard and are guided by said base relative to said guard, and

said base is a flexible disclike member extending transversely of the axial direction of said tubular portion radially outwardly from and hinged to said plug body, and said disclike member bears axially against said supporting means in the form of a circumferentially projecting portion of said guard.

4,481,950

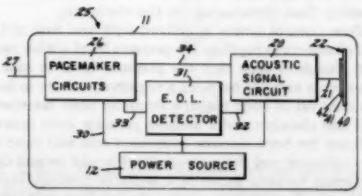
ACOUSTIC SIGNALLING APPARATUS FOR IMPLANTABLE DEVICES

Stephen R. Duggan, Rosemount, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 33,998, Apr. 27, 1979, abandoned. This application Apr. 3, 1981, Ser. No. 250,539

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PT **14 Claims**



1. Acoustic end of battery life signalling apparatus for an

implantable pacemaker which has a battery and a housing, comprising:

(a) a transducer for generating acoustic signals in response to applied electrical signals;

(b) means mounting said transducer in said pacemaker adjacent the housing of the pacemaker;

(c) an oscillator circuit operable when energized to apply electrical signals to the transducer;

(d) an energy storage capacitor;

(e) first switching means connected for selectively charging the energy storage capacitor from the battery of the pacemaker, said switching means connected for switching on in response to pulses from an output of the stimulating pulse generating circuit of the pacemaker;

(f) battery end-of-life detection means for producing a signal in response to a drop in the output of the pacemaker battery to a predetermined level;

(g) further switching means selectively connecting said energy storage capacitor to said oscillator circuit, and means connecting said further switching means for control by the signal produced by the end-of-life detector, whereby the acoustic signalling apparatus is enabled to transmit acoustic pulses warning of the end of battery life.

4,481,951

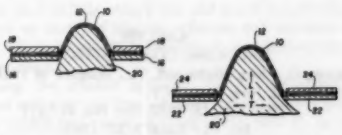
METHOD OF FABRICATING TWO LAYER CUPS AND BRASSIERE

Raymond Cole, Hillsdale; Raymond Kennedy, Montvale, and Lincoln McCluskey, Montville, all of N.J., assignors to International Playtex, Inc., Stamford, Conn.

Division of Ser. No. 280,402, Jul. 6, 1981, Pat. No. 4,375,445. This application Feb. 17, 1983, Ser. No. 467,524

Int. Cl.³ A41C *3/00*

U.S. Cl. 128—516 **9 Claims**



1. A method of fabricating a brassiere comprising:

attaching a first layer of stretchable material having an area less than the total area of a to-be-formed cup to a second layer of stretchable material, said second layer to form a unitary half of a brassiere including the cup portion, support frame portion and torso-encompassing portion;

molding a first area including a substantial portion of said first layer and juxtaposed portions of said second layer to form the crown of the cup;

molding a second area of said first and second layers including said first area to form the remainder of the cup;

repeating the preceding steps to form another cup;

attaching elastomeric trim to the upper edges of said second layers;

joining said second layers at a lateral edge;

attaching a continuous elastomeric band along the bottom of the joined second layers;

attaching complementary fasteners to the other lateral edges of said second layers; and

attaching a pair of shoulder straps to said second layer.

4,481,952

DEVICE FOR THE STUDY OF THE ALIMENTARY CANAL

Jerzy Pawelec, 18, 1 Longangstraede, 1468 Copenhagen K, Denmark

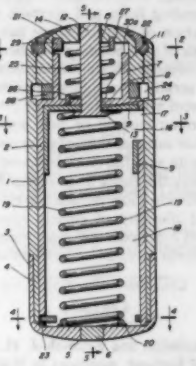
PCT No. PCT/DK79/00011, § 371 Date Nov. 22, 1979, § 102(e) Date Nov. 21, 1979, PCT Pub. No. WO79/00811, PCT Pub. Date Oct. 18, 1979

PCT Filed Mar. 21, 1979, Ser. No. 245,346

Claims priority, application Denmark, Mar. 22, 1978, 1334/78

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—769 **44 Claims**



1. A swallowable device for use in the examination of the alimentary canal, said device comprising: a container having at least one inner, sample-receiving chamber and at least one opening defining an inlet port for said chamber; blocking means disposed on and cooperating with said container for maintaining said opening out of communication with the exterior of said container; said blocking means being comprised of a substance of a material having properties which enable it to dissolve following contact with predetermined contents of the alimentary canal, to cause said opening to be communicated with the exterior of the container, allowing a sample to pass from the alimentary canal into said inner chamber; closing means including a sealing member movable to seal off said opening after a sample has passed ino said inner chamber, and operating means for permitting said sealing member to move to seal off said opening only after a sample has passed into said inner chamber.

4,481,953

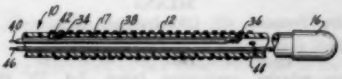
ENDOCARDIAL LEAD HAVING HELICALLY WOUND RIBBON ELECTRODE

Philip Gold, Pompano Beach, and Peter P. Tarjan, Miami, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 320,410, Nov. 12, 1981,. This application Dec. 29, 1983, Ser. No. 566,573

Int. Cl.³ A61N *1/00*

U.S. Cl. 128—786 **6 Claims**



1. An endocardial lead comprising:

an elongated, flexible, insulative tubing having proximal and distal ends, said insulative tubing having an aperture extending through the wall of said tubing at a predetermined position along the length of said tubing;

an elongated, flexible, central conductor positioned within

said insulative tubing, said central conductor having an insulative coating surrounding said central conductor over substantially the entire length thereof except for proximal and distal end portions of said central conductor;

the proximal end portion of said central conductor being connected to an electrical connector adapted for connection to a pulse generating device;

an elongate ribbon-shaped flat conductive bonding member extending generally parallel to the axis of said tubing on said tubing, having a length substantially greater than its width, and having one end electrically connected to said distal end portion of said central conductor within said insulative tubing, said elongate ribbon-shaped bonding member extending from said aperture and along and on the outer surface of said insulative tubing for essentially the full length of said bonding member; and

a continuously wound ribbon-shaped conductive electrode having a generally rectangular cross-section and being helically wound with a plurality of closely spaced turns around the outer surface of said insulative tubing and having flat side surfaces thereof over and in direct electrical contact with said flat ribbon-shaped bonding member for substantially the entire length of said bonding member to thereby provide a low impedance electrical connection between said plurality of closely spaced turns of said ribbon shaped electrode and said central conductor and between adjacent turns of said ribbon-shaped electrode.

4,481,954

CIGARETTES

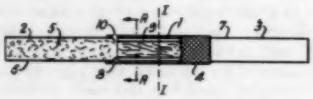
John A. Luke, Eastleigh, and Kenneth J. H. MacLean, Southampton, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed Jul. 27, 1982, Ser. No. 402,242

Claims priority, application United Kingdom, Aug. 3, 1981, 8123697

Int. Cl.³ A24D *1/02*

U.S. Cl. 131—77 **5 Claims**



1. A method for modifying the peripheral conformation of a cigarette, wherein the cigarette, which has an external, heat-deformable, wrapper comprising a proportion of thermoplastic fibres or filaments, and a heated forming means are relatively moved in contact with each other in a direction transverse to the longitudinal axis of the cigarette said cigarette relatively moved in contact with the heated forming means being a double-length filter-tipped cigarette with a tipping wrapper enwrapping the full length of the filter element and a short length of each of the cigarette rods thereby interattaching the same.

4,481,955

CIGARETTE HOLDER WITH TAR COLLECTING MEANS

Masahiro Terasaki, 43, Okimiya-cho, Edogawa-ku, Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,153

Claims priority, application Japan, Jul. 29, 1982, 57-116084[U]

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—216 **7 Claims**

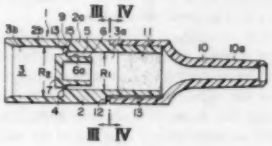
1. A cigarette holder comprising a tar collecting means comprising an integrally formed body member comprising:

an outer hollow cylindrical portion with open opposite ends and first and second bores extending from the opposite ends toward an axially intermediate position thereof, said first bore having a larger diameter than said second bore;

a transverse dividing wall portion extending at said axially intermediate position across the inner space within said hollow cylindrical portion, and separating said first bore and said second bore;

an inner cylindrical portion extending from said dividing wall portion coaxially with said outer hollow cylindrical portion for a certain axial distance into said second bore and defining in cooperation with the inner peripheral surface of said hollow cylindrical portion an annular space therebetween;

said dividing wall portion being pierced with a groove which extends axially across an outer peripheral portion



of said dividing wall portion from the side of said first bore toward the side of said second bore beyond the thickness of said dividing wall portion, said groove having a radial depth larger than a half of the difference between the diameters of said first and second bores, thereby defining a restricted passage which communicates said first bore to said annular space and is defined on its side by a deflecting wall portion which deflects a flow of fluid flowing therethrough toward the outer peripheral surface of said inner cylindrical member;

said first bore within said hollow cylindrical member being adapted for a cigarette to be wedged thereinto so as to receive the smoke from said cigarette;

said second bore within said hollow cylindrical member being adapted for applying sucking action by a smoker.

4,481,956

SMOKING COMPOSITIONS

Woontung G. Chan, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,271

Int. Cl.³ A24B *3/12, 15/32*

U.S. Cl. 131—276 **3 Claims**

1. A smoking product having added thereto a β-ketocarboxylic acid ester of a carbohydrate or of an alkyl polyol.

4,481,957

SMOKING COMPOSITIONS CONTAINING NOVEL ACYLPYRAZINE FLAVORANTS

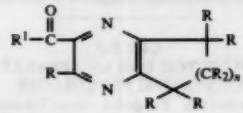
David L. Williams; Everett W. Southwick, and Yoram Houminer, all of Richmond, Va., assignors to Philip Morris, Incorporated, New York, N.Y.

Filed Sep. 23, 1982, Ser. No. 421,922

Int. Cl.³ A24B *3/12, 15/38*

U.S. Cl. 131—278 **9 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco, non-tobacco substituents, and mixtures, thereof, and (2) between about 0.00001 and 2 weight percent, based on the total weight of filler, of a bicyclic acylpyrazine corresponding to the formula:



where R is a substituent selected from hydrogen and alkyl groups containing between about 1–12 carbon atoms; R^1 is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–20 carbon atoms; and n is an integer in the range of 1–6.

4,481,958

COMBUSTIBLE CARBON FILTER AND SMOKING PRODUCT

Norman B. Rainer, and Gus D. Keritsis, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 25, 1981, Ser. No. 296,233

Int. Cl.³ A24D *1/18, 3/00, 3/02, 3/06*

U.S. Cl. 131—331 **13 Claims**

1. A method of making a combustible carbonized rod for use in a smoking product comprising:

contacting cellulosic paper made by the wet papermaking process with an aqueous solution of a binding agent;

repeatedly folding the wet paper along its longitudinal axis to form a substantially cylindrical bundle;

advancing the substantially cylindrical bundle through a heated die to remove the water and produce a coherent cellulose rod which maintains its integrity in the absence of any external wrapping, said die being selected such that the cellulose rod emerging therefrom has a diameter of at least about 11 mm;

treating the resulting unwrapped cellulose rod with an additive selected from the group consisting of $Na_2B_4O_7$, $CaCl_2$, $K_4Fe(CN)_6$, $Al_2(SO_4)_3$ and Cu_2SO_4 and mixtures thereof so that the treated cellulose rod contains from about 1% to about 5% by weight of the additive on a dry weight basis;

pyrolyzing the treated cellulose rod by advancing said treated cellulose rod through a die maintained at a temperature within the range of from about 500° C. to about 1000° C. in an oxygen-free atmosphere for a total retention time in the die of from about 3 seconds to about 1 minute, said die being selected such that the pyrolyzed rod emerging therefrom has a diameter of from about 7 mm to about 9 mm; and

cooling the pyrolyzed rod to less than about 250° C. before removing the pyrolyzed rod from the oxygen-free atmosphere.

4,481,959

FILTERING MEANS

Stanley W. Byrne, North Crawley, England, assignor to American Filtrona Corporation, 8401, Richmond, Va.

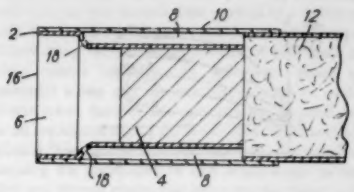
Filed Jul. 2, 1982, Ser. No. 394,780

Claims priority, application United Kingdom, Jul. 6, 1981, 8120822

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—336 **6 Claims**

1. A tobacco smoke filter comprising an axially elongate filtering core, and a plugwrap in surrounding engagement with the core and extending axially therebeyond to define a recess, the outer surface of the plugwrap providing at least one channel extending longitudinally of the filter from an end thereof, wherein at least one said channel commences part way along



said recess and extends therefrom the full length of the filtering core to the other end of the filter.

4,481,960

CIGARETTES

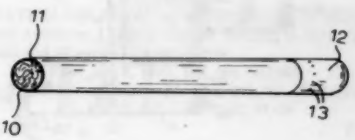
Geoffrey O. Brooks, Southampton, Great Britain, assignor to British-American Tobacco Company Limited, London, England

Filed Jul. 27, 1982, Ser. No. 402,252

Claims priority, application United Kingdom, Aug. 5, 1981, 8123959

Int. Cl.³ A24D *1/00, 1/02*

U.S. Cl. 131—336 **8 Claims**



1. A smoking article which comprises a rod of smoking material contained within a wrapper having an air-permeability within a range of from 20 to about 120 Coresta units and is provided, in the region of the mouth end of the article, with ventilation means to give a degree of ventilation of 15 to 90%, the ratio of carbon monoxide yield to tar yield of the smoking article being less than 0.9.

4,481,961

METHOD FOR SETTING HAIR AND A DEVICE FOR CARRYING OUT THE SAID METHOD

Daniel P. Bauer, Le Raincy; Jean-Paul H. Beck, Paris, and Jean-Claude J. Grognet, Villers S/Coudun, all of France, assignors to L'Oreal, Paris, France

Filed May 27, 1981, Ser. No. 267,548

Claims priority, application France, May 30, 1980, 80 12110

Int. Cl.³ A45D *7/00*

U.S. Cl. 132—7 **16 Claims**

1. A method for non-permanently shaping or setting hair comprising

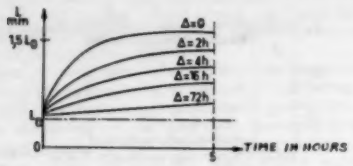
(a) moisturizing said hair,

(b) rolling said moisturized hair on hair shaping means,

(c) drying said rolled up and moisturized hair to the extent that, by removal of water therefrom, the weight of the resulting dried hair is 1 to 15 percent less than the weight of said hair prior to moisturizing said hair,

(d) conditioning said dried and rolled up hair for a period of time ranging from 5 to 60 minutes in an atmosphere having a relative humidity of from about 35 to 80 percent, at a temperature from about 35° C. to 75° C. whereby moisture is imparted to said hair, the amount of imparted mois-

ture, measured as a percentage relative to the weight of said hair prior to being moisturized, only differs from the



weight of said dried hair resulting from drying step (c) by less than 2 percent, and

(e) unrolling said hair.

4,481,962

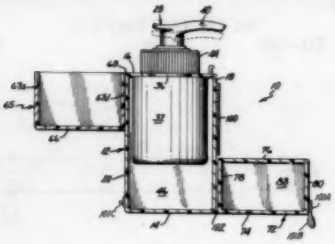
PORTABLE TOILETRY STAND

Richard K. Pesta, 5500 Ascot Ct., #120, Alexandria, Va. 22311

Filed Mar. 1, 1982, Ser. No. 353,060

Int. Cl.³ A45D *40/00*

U.S. Cl. 132—79 R **9 Claims**



1. A portable stand for holding toiletries comprising:

a box portion with a top, first and second parallel side walls and first and second end walls joined to the side walls, each wall having a bottom edge, the bottom edges forming a base area plane;

at least one fluid dispenser mounted in the box portion through the top, each fluid dispenser having a fluid reservoir inside the box portion and a dispenser nozzle above the top; and

a first tubular compartment defined by four side compartment walls and hingedly attached to a first side wall of the box portion adjacent the bottom edge thereof, one of the side compartment walls comprising a support plate generally conforming in shape and size to the base area plane of the box portion and a second side compartment wall extending generally rigidly perpendicular to the support plate, the second side compartment wall being joined to the support plate along a junction line, the hinge attachment of the first compartment to the first side wall being adjacent the junction line, and the first compartment being movable between a first position with the support plate against the base area plane of the box portion wherein the first compartment extends from the base area plane away from the box portion, the side compartment walls being substantially within the space defined by the surface of the box portion side walls with the first compartment in its first position, and a second position wherein the support plate is hinged away from the base area plane of the box portion and the plane of the support plate extends laterally from and is essentially coplanar with the base area plane and the second side compartment wall extends above the base area plane and engages and rests against said first side wall of the box portion so that the support plate supports the box portion and thereby resists tipping of the box portion in direction toward the first side wall when the box portion rrests on the base plane area and support plate.

4,481,963

DROP COLLECTOR FOR AN APPARATUS FOR CONVEYING ELECTRODES

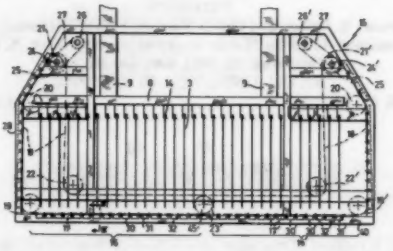
Constant T. Verhoeven, Poederlee; Jean-Francois Viellefont, Herentbout, and Robert Dierckxsens, Olen, all of Belgium, assignors to Metallurgie Hoboken-Overpelt, Hoboken, Belgium

Filed Jun. 8, 1983, Ser. No. 502,215

Claims priority, application Luxembourg, Feb. 22, 1983, 84654

Int. Cl.³ B08B *3/04*

U.S. Cl. 134—104 **13 Claims**



1. A drop collector for an apparatus for conveying dripping electrodes having a carriage and a rack for electrodes suspended from the carriage, said drop collector comprising:

(a) a series of parallel gutters, each gutter having at least one outlet orifice,

(b) means for bringing said series of gutters from a lower work position, in which the gutters are juxtaposed and located under the electrodes, through an intermediary position, in which said series of gutters is curved, to a higher rest position, in which the gutters are superposed, and vice versa,

(c) a reservoir, the entry of which is located under the outlet orifices of the gutters, when said series of gutters is in the work position, and

(d) a frame fastened to the carriage of the conveying apparatus and in which said means for bringing and said reservoir are disposed.

4,481,964

COMBINATION WALKING STICK AND SHOOTING REST

William J. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio

Filed Sep. 13, 1982, Ser. No. 416,814

Int. Cl.³ A45B *5/00*

U.S. Cl. 135—66 **9 Claims**

1. A shooter's walking stick comprising:

a generally L-shaped body having an elongated first member and a second member extending in an approximately perpendicular direction from one end of said first member;

a plurality of uniformly shaped scallops evenly formed along a substantial portion of said elongated first member and continuing onto the adjacent edge of said second member to form finger gripping positions on said second member; and

shooting support means for selectively engaging said plurality of scallops and comprising a third member having an aperture formed therein for receiving said elongated first member, said aperture having end faces conforming to said scallops and being spaced such that said third member slides over said scallops at a first defined orientation of

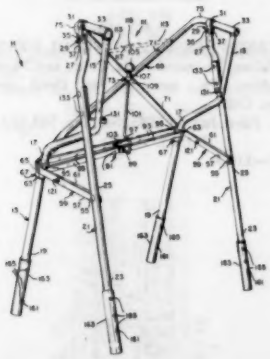
said third member to said first member and engages said scallops at a second defined orientation of said third member to said first member to define a plurality of support positions along said elongated first member.

4,481,965

COMPACT FOLDING WALKING AID

Mervyn M. Watkins, 30241 Via Borica, Rancho Palos Verdes, Calif. 90274

Filed Sep. 30, 1982, Ser. No. 431,042
Int. Cl.³ A61H *3/00*
U.S. Cl. 135—67 **13 Claims**



1. A compact folding walking aid for supporting persons who have difficulty walking, comprising:

a pair of parallel elongated frame tubes each having upper, intermediate and lower portions, said frame tubes generally defining a first plane therebetween;

a pair of parallel elongated side tubes each having upper, intermediate and lower portions, said upper portions of each of said side tubes being pivotally attached at a fixed position along said upper portion of a different one of said frame tubes, said side tubes generally defining a second plane therebetween that intersects said first plane at an acute angle, and generally defining respective parallel third and fourth planes between themselves and associated frame members, which planes are orthogonal to said first and second planes;

a front x-brace having a pair of pivotally interconnected front brace members, the upper ends of each of said front brace members being pivotally attached to a different one of said upper portions of said frame tubes;

a pair of side brace members each pivotally attached at their rear ends to said intermediate portion of a different one of said side tubes, the length of said brace members primarily determining the maximum amount of said acute angle;

folding means including an individual guide movably mounted along said intermediate poriton of each of said frame tubes, each of said guides being pivotally attached to an associated one of the respective lower and front ends of said front and side brace members, for simultaneously causing the decreasing of said acute angle between said first and second planes and lessening the distance between said third and fourth planes when said guides move downwardly along respective frame tubes to a fully folded walking aid position, and for simultaneously causing the increasing of said acute angle and the increasing of said distance between said third and fourth planes when said guides move upwardly along respective frame tubes to a fully unfolded walking aid position; and

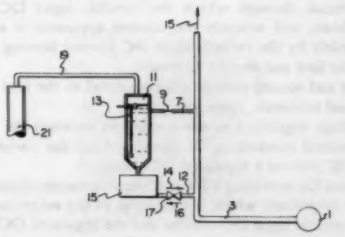
releasable pivoted locking means for maintaining said walking aid in said unfolded walking aid position with all pivotal attached members remaining pivotally attached when the walking aid is fully folded.

4,481,966

WATERLINE FREEZE PROTECTION SYSTEM

Raymond Anderson, Langley, Canada, assignor to Brag Systems Canada Ltd., Langley, Canada

Filed Jul. 8, 1983, Ser. No. 512,066
Claims priority, application Canada, Feb. 11, 1983, 421374
Int. Cl.³ E03B *7/12*; F16L *55/00*
U.S. Cl. 137—59 **1 Claim**



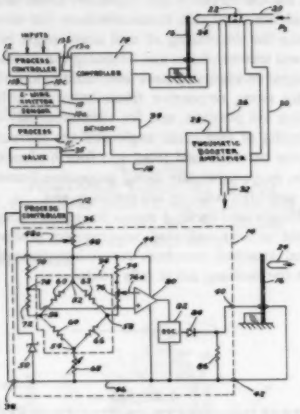
1. A water line freeze protection system consisting of first and second branch pipes separately extending from a water service pipe, a water holding tank, a metering orifice between the first branch pipe and the holding tank, a pump and a check valve between the holding tank and the second branch pipe, the check valve being between the pump and the service pipe, the check valve permitting flow of water only in the direction from the pump to the second branch pipe, a float and switch secured to the holding tank to activate the pump at an upper water level and deactivate the pump at a lower water level, said freeze protection system being achieved by the continuous flow of water through a loop consisting of a portion of the service pipe and through said first branch pipe, said metering orifice, said holding tank, said pump, said check valve and returning to said service pipe portion through said second branch pipe during the operation of said pump to create a heat effect in said service pipe portion and an overflow pipe from the holding tank to pass water from the holding tank into a drain when the pump is nonoperational.

4,481,967

CONTROL CIRCUIT FOR CURRENT TO PRESSURE CONVERTER

Roger L. Frick, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 94,444, Nov. 15, 1979, abandoned. This application Feb. 25, 1982, Ser. No. 352,312
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—85 14 Claims



1. A two wire DC electrical control apparatus for providing an output fluid pressure at an output which is a function of a magnitude of a variable input DC current, and which is energized solely by the variable input DC current the apparatus comprising:

first and second terminals adapted to be connected in a circuit through which the variable input DC current flows, and wherein the control apparatus is energized solely by the variable input DC current flowing between the first and second terminals;

first and second conductors connected to the first and second terminals, respectively;

voltage regulating means connected between the first and second conductors for deriving from the variable input DC current a regulated DC voltage;

means for providing a DC electrical command signal having a magnitude which is a function of the magnitude of the variable input DC current and the regulated DC voltage;

means for providing the output fluid pressure at the output as a function of a magnitude of a DC electrical control signal;

means powered by the regulated DC voltage for providing the DC control signal with a magnitude which is a function of the magnitude of a DC command signal and a magnitude of a DC feedback signal, wherein the means for providing the DC control signal adjusts the magnitude of the DC control signal when the magnitudes of the DC command signal and the DC feedback signal do not have a predetermined relationship, and causes the magnitude of the DC control signal to remain constant when the magnitudes of the DC command signal and the DC feedback signal have the predetermined relationship; and

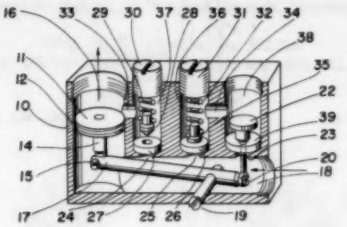
pressure transducer means powered by the regulated DC voltage and being connected directly to the output fluid pressure at the output and electrically coupled to the means for providing the DC control signal for providing the DC electrical feedback signal with a magnitude which is a function of the output fluid pressure and the regulated DC voltage.

4,481,968

REGULATOR-UNLOADER FOR HIGH PRESSURE SPRAYING EQUIPMENT

Jacob E. Iverson, 451 SW. 18th Ct., Pompano Beach, Fla. 33060

Filed Mar. 8, 1982, Ser. No. 356,015
Int. Cl.³ F16K *31/38*
U.S. Cl. 137—116 9 Claims



1. A regulator-unloader for fluid systems comprising, in a housing;

(a) an inlet passageway;

(b) an outlet passageway connected to said inlet passageway;

(c) a piston movable within said outlet passageway;

(d) an outlet valve connected to said inlet passageway and to said outlet passageway outwardly of said piston;

(e) a bypass passageway connected to said inlet passageway;

(f) a main bypass valve spaced within said bypass passageway; and

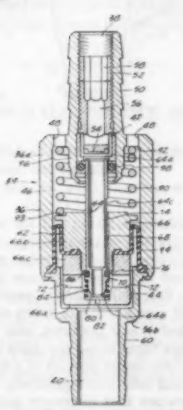
(g) a rod spaced within said inlet passageway and connected at one end to said piston and at the other end to said bypass valve; said rod being pivotally mounted in the housing at a point intermediate its ends.

4,481,969

FLUID PRESSURE CONTROL DEVICE

Merton R. Fallon, Thousand Oaks, Calif., and Thomas W. Clements, Ambler, Pa., assignors to Draft Systems, Inc., Northridge, Calif.

Filed Jun. 6, 1983, Ser. No. 501,432
Int. Cl.³ G05D *16/06*
U.S. Cl. 137—116.5 8 Claims



1. A fluid pressure control device comprising:

(a) a housing having a fluid inlet and a fluid outlet and including a first internal chamber in communication with said fluid inlet, a second internal chamber in communica-

tion with said fluid outlet, and a third internal chamber in communication with atmosphere;

(b) a first valve seat carried by said housing and disposed within said first chamber;

(c) a piston assembly disposed interiorly of said housing for axial movement therewithin between first and second positions, said piston assembly comprising:

(1) a piston body having an axial bore extending partially therethrough, an upper face, a lower face, and at least one fluid passageway interconnecting said axial bore and said second chamber;

(2) a second valve seat disposed within said axial bore proximate the lower end thereof;

(3) a tubular shaped stem member telescopically receivable within said axial bore of said piston body, said stem having a first end disposed in said first chamber and a second end disposed in close proximity with said second valve seat, said first end being movable into pressural engagement with said first valve seat when said piston assembly is moved from said first to said second position, and said second end being movable into pressural engagement with said second valve seat upon a predetermined degree of relative movement between said piston body and said stem; and

(4) first biasing beans for yieldably resisting relative movement between said piston body and said stem;

(d) first sealing means carried interiorly of said housing for preventing fluid flow between said second and third chambers when said piston assembly is in a first position;

(e) second sealing means disposed between said stem and said housing for preventing fluid flow between said first and third chambers; and

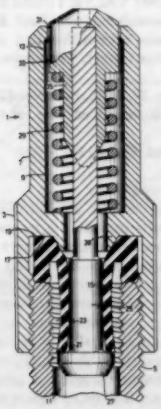
(f) second biasing means carried internally of said housing for yieldably resisting movement of said piston assembly from said first position to said second position when the fluid pressure within said second chamber is below a predetermined level.

4,481,970

TIRE VALVE

Philip L. Reid, Duncan, S.C., assignor to Jack H. Zabel, Jr., Simpsonville, S.C.

Filed Jun. 10, 1982, Ser. No. 387,154
Int. Cl.³ F16K *19/00*
U.S. Cl. 137—223 **3 Claims**



1. A valve for separating a low pressure area from a high pressure area, comprising;

a hollow housing generally capable of establishing fluid communication through the hollow thereof between said low pressure area and said high pressure area;

a generally hollow elastomeric sleeve within the hollow of said housing and hermetically engaged therewith at one end thereof and with the other end thereof being generally unengaged thereby defining a space between said sleeve and said housing, said space being maintained in fluid communication with said high pressure area at all times, said sleeve portion exposed to said space having a length substantially greater than its diameter;

a cylindrical pin axially located within the hollow of said elastomeric sleeve, said cylindrical pin having a diameter of less than the diameter of the hollow of said elastomeric sleeve, but having an enlarged end of a greater diameter that the diameter of the hollow of said elastomeric sleeve, said cylindrical pin extending from said one end through said other end of said sleeve and said enlarged end portion being beyond said other end of said sleeve;

means for biasing said enlarged end against said other end of said hollow sleeve to preclude fluid communication between said high pressure area and said low pressure area when said enlarged end is in contact with said other end of said sleeve; and

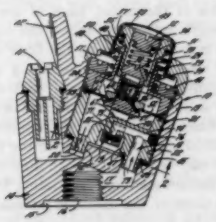
wherein, said enlarged end of greater diameter cooperates with said hollow elastomeric sleeve when in contact with the other end thereof to collapse said elastomeric sleeve about said cylindrical pin in the area thereof having said diameter less than the diameter of the hollow of said elastomeric sleeve to preclude fluid communication through said hollow elastomeric sleeve and the high pressure within said space maintaining said sleeve in a collapsed state about said cylindrical pin.

4,481,971

REGULATOR AND SHUT-OFF VALVE ASSEMBLY

Gerald J. Farrell, Elmhurst, and Edward Mayer, North Riverside, both of Ill., assignors to Elkay Manufacturing Company, Broadview, Ill.

Filed Jan. 28, 1983, Ser. No. 461,692
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—315 **5 Claims**



1. In a valve assembly of the cartridge type, said valve having, a cylindrical body of predetermined diameter, said body being rigid and having inner and outer ends, said body having an inlet passage and an outlet passage adjacent the inner end thereof, said inlet passage terminating in an opening facing axially inwardly and being coaxial with said body, a valve seat formed around said opening, a valve member facing axially outwardly to engage said seat and close said inlet passage, a valve stem rigid with said valve member and extending axially outwardly through said body, means supporting said stem for axial movement thereby to move said valve member toward and away from said valve seat, and actuator operable manually to move said stem axially inwardly thereby to move said valve member away from said seat and permit said inlet passage to communicate with said outlet passage through the interior of said body, the improvement comprising, a bar formed integrally with said body and extending generally diametrically across the interior of the latter, at least a portion of said inlet passage extending transversely of said bar, said opening of said inlet passage being formed in said bar and said valve seat being

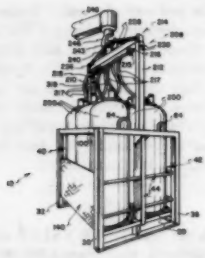
an integral part of said bar, said valve stem including an inner part and an outer part, said outer part being disposed outwardly of said bar and operatively attached to said actuator, said inner part being U-shaped with the crossbar of the U facing said valve seat and the legs of the U projecting outwardly and straddling said bar prior to the assembly of said outer part to said inner part, and coacting means formed on the end portions of said legs and on said outer part and operable with engaged to lock the inner and outer parts together thereby to complete the assembly of said inner and outer parts.

4,481,972

PALLET FOR PRESSURIZED GAS CYLINDERS

Lars G. Stavlo, Sigtuna, Sweden, assignor to AGA AB, Cleveland, Ohio

Filed Sep. 9, 1982, Ser. No. 416,118
Int. Cl.³ F16L *3/00*
U.S. Cl. 137—376 **15 Claims**



1. A pallet for pressurized gas cylinders comprising:
(a) a floor structure for supporting a plurality of gas cylinders;
(b) an upstanding center structure including a pair of upstanding posts projecting upwardly from each of two opposite sides of the pallet, each of the posts being of sufficient length to extend above the tops of such gas cylinders as may be carried on the floor structure;
(c) the center structure further including a cross member which is rigidly secured to upper ends of the posts and cooperating with the posts to define an inverted U-shaped framework means for protectively supporting a gas distribution manifold at a location above the tops of such gas cylinders as may be carried on the floor structure;
(d) a gas distribution manifold depending from and carried by the cross member, the manifold including a plurality of ports; and,
(e) flexible conduit means for communicating each of the ports to a separate one of such pressurized gas cylinders as may be carried on the floor structure.

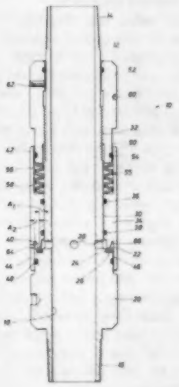
4,481,973

DIFFERENTIAL PRESSURE ENERGIZED CIRCULATING VALVE

Thomas B. O'Brien, and Edwin W. Thomas, both of Midland, Tex., assignors to O'Brien Goins Engineering, Inc., Midland, Tex.

Filed Jan. 31, 1983, Ser. No. 462,666
Int. Cl.³ F16K *17/20*
U.S. Cl. 137—469 **26 Claims**

1. A circulating valve for connection into the tubing string of a well for establishing selective flow of fluid between the tubing string and well casing, said circulating valve comprising:
(a) valve body means adapted for connection to sections of tubing and defining a flow passage in registry with the flow passage of the tubing string, said valve body means defining valve chamber means and having inner and outer concentric sealing means;
(b) seat means being disposed within said valve chamber means;
(c) valve means being movable within said valve chamber means and engaging said seat means in the closed condition thereof, said valve means establishing sealing engagement with said inner and outer concentric sealing means;
(d) said valve body means defining inlet opening means



upstream of said seat means and permitting flow of fluid into said valve chamber to said seat means; and
(e) said valve body means further defining outlet opening means downstream of said seat means, said outlet opening means being of less dimension as compared to the dimension of said inlet opening means, said outlet opening means permitting maintenance of injection pressure level within said valve chamber and acting on said valve means after differential pressure opening of said valve means said injection pressure to maintain said valve means open.

4,481,974

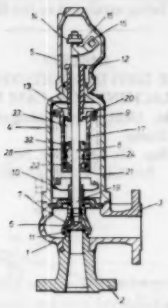
SAFETY VALVE WITH FRICTION MEANS FOR DAMPING VALVE VIBRATION

Manfred Schmitt, Friedelsheim, and Emil Zitzelsberger, Heppenheim/Kirschhausen, both of Fed. Rep. of Germany, assignors to Bopp & Reuther GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,977
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210768
Int. Cl.³ F16K *17/04*
U.S. Cl. 137—514 **11 Claims**

1. A safety valve, comprising
valve means having an axis, immovable valve parts, and movable valve parts including a movable valve element provided with a valve closing member and movable in a vlave stroke between open and closed positions; and
friction means arranged between said immovable valve parts and said movable valve parts for damping vibrations of said valve means, said friction means including at least one friction unit having a plurality of friction members with friction surfaces and movable radially relative to said axis, a stationary abutment member, a pressing member arranged to move said friction members so that said friction surfaces of said friction members are pressed against a friction countersurface of said movable valve element and so that said friction members abut against said abutment member at their side facing toward said valve closing member, and a pretensioned auxiliary spring acting upon said friction members at their side facing away from said valve closing member and in a valve closing direction,

said auxiliary spring having such a force and such a small resistance that in the event of undesired seizing of said friction surfaces of said friction members with said friction countersurface of said movable valve element said auxiliary spring is compressed away from said friction members over the valve stroke in a valve opening direction and within a pressure premissible for a valve opening, each of said friction members having two faces which face toward and away of said valve closing member, respectively, at



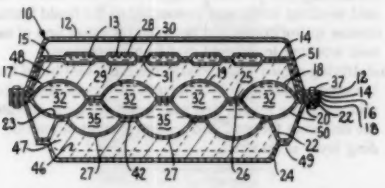
least one of said faces of each of said friction members being inclined and acting in a wedge-like manner, said friction means further including at least one pressing piece arranged between said friction members and said auxiliary spring, at least one of said abutment member and said pressing piece having corresponding wedge counterfaces with which said inclined faces of said friction members cooperate for transmitting the force of said auxiliary spring to said friction surfaces of said friction members.

4,481,975

MULTI-SHEET CORRUGATED TANK CONSTRUCTION FOR PASSIVE SOLAR HEATING SYSTEMS

Bruce S. Buckley, San Jose, Calif., assignor to B. Shawn Buckley, San Jose, Calif.

Filed Jun. 24, 1982, Ser. No. 391,837
Int. Cl.³ E03B *11/02*
U.S. Cl. 137—561 A **9 Claims**



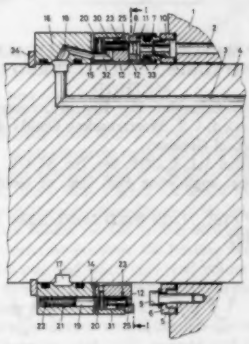
1. A liquid storage tank or the like formed of a plurality of thin sheets of formable material, the surface of each of said sheets of said plurality being formed with a plurality of undulations, the peaks and troughs of said undulations extending parallel with each other, said undulations being generally wave-like in configuration to form a wave train and said sheets being secured together so that at least the peak area of one sheet abuts a corresponding parallel peak area in another of said sheets and an additional sheet includes undulations having a spacial frequency at least as great as said wave train with a peak of at least one said undulation of said additional sheet bonded along the extension of at least one of said wave train peaks and another portion of said additional sheet bonded along an area parallel thereto spaced at least as far apart as the next peak in the wave train of the two abutting sheets, said sheets being joined together along at least their two side edges parallel to said undulations and the end edges of said sheets being enclosed to form said tank, and passageways formed in a surface of said sheets forming said undulations for communication of liquid therethrough.

4,481,976

APPARATUS FOR PASSING A PRESSURE MEDIUM FROM A STATIONARY HOUSING TO A ROTATABLE SHAFT

Ivan J. Cyphelly, Hinteregg, Switzerland, assignor to Glyco-Antriebstechnik GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,319
Claims priority, application Switzerland, Mar. 30, 1981, 2147/81
Int. Cl.³ F16L *27/00*
U.S. Cl. 137—580 **12 Claims**



1. An apparatus for passing a pressure medium from a stationary housing provided with sliding pads to a rotatable shaft provided with bores for supplying the pressure medium to a consumer, the shaft being surrounded by a ring rotating with the shaft and the ring having a sealing face for the sliding pads extending over a portion of the circumference of the ring, to rest upon, the ring further having a plurality of check valves distributed over the entire circumference of the ring and each containing a valve plate, the check valves communicating on one side with discharge points located in the sealing face and on the other side with the supply bores in the shaft, the apparatus comprising:

the valve plate of each check valve (**23**; **23'**) being embodied as a plug (**25**; **41**), having an end face (**29**; **42**) located in the plane or the face of the sealing face (**12**; **39**) for the sliding pads (**8**; **47**) whenever the check valve (**23**; **23'**) is in its closing position,

and means for ventilating the pressure medium stored behind the check valves when pressure exerted by the sliding pads on the rotating ring is interrupted.

4,481,977

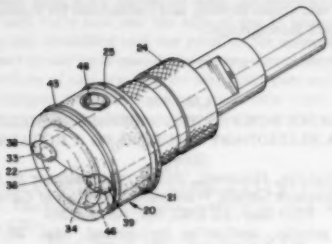
DUST CAP FOR FLUID COUPLING

Ojars Maldavs, Lincoln, Nebr., assignor to Imperial Clevite Inc., Glenview, Ill.

Filed Jul. 18, 1983, Ser. No. 514,526
Int. Cl.³ F16L *55/00*
U.S. Cl. 138—89.4 **8 Claims**

1. A dust cap for a coupling comprising a generally cylindrical body adapted to be mounted on the coupling, an end wall at one end of the cylindrical body, the end wall having a slit therein for permitting another coupling to be inserted through

the end-wall and a stress relief opening at each end of the slot, and a flap covering each of the stress relief openings which is



flexible and resilient and adapted to sealingly engage a coupling which is inserted through the end wall.

4,481,978

METHOD OF MANUFACTURING HELICALLY WOUND TUBES AND TUBES MANUFACTURED BY SAID METHOD

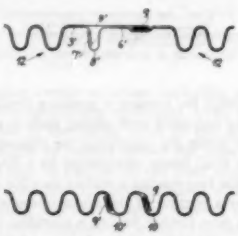
Manuel Escandell, Gütersloh, Fed. Rep. of Germany, assignor to Westaflex-Werk L.U.F. Westerbarkey GmbH & Co., Gütersloh, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,479

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1978, 2829283

Int. Cl.[3] **F16L** *11/00*; **B21D** *39/03*; **B23P** *11/00*

U.S. Cl. 138—122 **4 Claims**



1. A method of producing from strips of thin plate or sheet which are at least partially pre-grooved parallel to their longitudinal edge, helically wound tubes which are beaded along the entire longitudinal edges of the strips, comprising the steps of providing a rib on the longitudinal edge of the pre-grooved strip whose outer arm forms a narrow region that has an edge bent approximately at a right angle to form a rim which is shorter than the depths of the grooves, providing on the other longitudinal edge of the pre-grooved strip a region about twice as wide as said narrow region that has a bend in the same direction as the rib which is shorter than the depths of the grooves, winding the strip into a tube, engaging the bend in the rim, folding the engaged bend over towards the side of the bend and against said twice as wide region, compressing the folded bend into a bead, and forming thereupon a further flat rib at the place of this bead in said narrow and about twice as wide regions, which further rib contains the bead included in a portion of one of its flanks, said portion being included within the flank and smaller then said whole flank, comprising after said step of compressing said folded bend into a bead, the further steps of winding a grooved second tube ply thereon in which a wide region that has an edge bent approximately at a right angle to form a rim which is shorter than the depths of the grooves is positioned adjacent to said wide region on said beaded tube, providing on the other longitudinal edge of the second tube a region about half as wide as said wide region that has a bend in the same direction as the rib which is shorter than the depths of said second tube grooves, compressing the folded bend into another bead that is spaced from said beaded tube bead by the width of an open groove, forming grooves or ribs at the beads, and forming the second tube bead in one of the flanks of the formed grooves which second tube bead is included within said flank and is smaller than said whole flank of which it is a part.

4. Tube manufactured by the method according to claim **1**, comprising the further step of providing grooves of equal spacing, the beads being arranged in the flanks of the grooves.

4,481,979

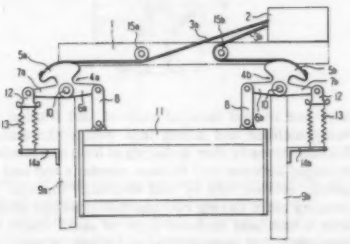
HEALD FRAME DRIVING METHOD IN NEGATIVE DOBBY MACHINES OR CAM MACHINES

Hiroyuki Mizuguchi, Aichi, Japan, assignor to Yamada Dobby Co., Ltd., Bisai, Japan

Filed Sep. 16, 1982, Ser. No. 418,788

Int. Cl.[3] **D03C** *13/00*

U.S. Cl. 139—84 **2 Claims**



1. A heald frame driving means in a loom having a negative shedding device and resilient transmission members connected to a shedding lever of said negative shedding device disposed above the heald frame which is driven thereby, said driving device comprising:

a pair of working levers pivotally supported on the upper portions of lateral frame members of said loom, said working levers having a sector surface formed on the upper side thereof and means for fixing said resilient transmission members respectively thereto;

a connecting rod pivotally supported at one end of each of said working levers and connected to the heald frame; and

a tension spring connected between the other end of each of said working levers and said frame members;

said driving means being so arranged that said heald frame is lowered when said transmission members are pulled by said shedding levers, and said heald frame is elevated by the restoring force of said tension springs when said shedding lever is restored.

4,481,980

DOUBLE DENT LIGHTWEIGHT REED CONSTRUCTION

William L. Stenhouse, Greenville, S.C., assignor to Steel Heddle Manufacturing Co., Greenville, S.C.

Filed Jul. 26, 1982, Ser. No. 402,162

Int. Cl.[3] **D03D** *49/62*

U.S. Cl. 139—192 **5 Claims**

1. A reed for beating-up a filling yarn at the fell of woven fabric on a textile loom of the type having a frame in which dent means is carried providing dent spaces through which individual warp yarn ends pass, said frame including an upper free side and a lower clamping side which is clamped on a lay beam of the loom by which the beat-up action is imparted to the reed, wherein the improvement comprises:

a first row of dents having a rectangular cross-section carried in said frame in side-by-side arrangement on a beat-up

side of said frame to define a first plurality of dent spaces through which said warp yarn ends pass;

a second row of dents having a rectangular cross-section carried in said frame in side-by-side arrangement defining a second plurality of dent spaces through which said warp yarn ends pass;

said second row of dents being arranged in said frame behind said first row of dents;

said dents of said second row being more flexible than the dents of said first row offering less resistance and facilitating passage of said warp yarn ends more freely through the dent spaces with reduced breakage and line accumulation;

said upper free side of said reed frame is lighter in weight than said lower clamping side reducing the inertial forces on said frame during beat-up;

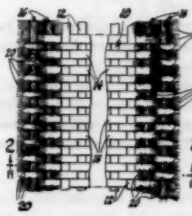
said dents of said second row have a greater free height than the corresponding free height of said dents of said first row in said frame rendering the dents of said second row more flexible in said frame than the dents of said first row.

4,481,981

SOFT EDGE SEAT BELT WEBBING

Klaus B. Motte, Grosse Pointe Park, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1983, Ser. No. 477,339
Int. Cl.³ D03D *15/00, 5/00*; A62B *35/00*
U.S. Cl. 139—426 R **1 Claim**



1. In a woven webbing for a seat belt having warp elements extending longitudinally of the webbing and weft elements extending transversely of the webbing and interwoven with the warp elements, the improvement comprising:

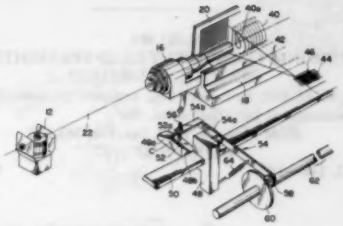
only the edgemost one or more of the plurality of warp elements at at least the edge of the belt disposed adjacent the occupant exposed skin being a yarn having flock fibers secured thereon and oriented perpendicular from the yarn and having a length to extend beyond the surface of the webbing as defined by the interwoven weft elements and warp elements so that the flock fiber presents a soft webbing edge for enhanced comfort against the exposed skin of a seat occupant.

4,481,982

WEFT PULL-BACK DEVICE OF A JET WEAVING LOOM

Takashi Ogasawara; Tetsuzi Hasebe, and Masayuki Koriyama, all of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 1, 1983, Ser. No. 518,916
Claims priority, application Japan, Aug. 4, 1982, 57-135094
Int. Cl.³ D03D *47/34*
U.S. Cl. 139—435 **14 Claims**



1. In a jet weaving loom having a frame, a reed holder pivotally movable relative to said frame in the downstream and unstream directions with respect to the motion of the warp threads, a jet nozzle movable with said reed holder and ejecting a weft thread into the shed of the warp threads by the jet action thereof, and a weft gripper for intermittently stopping the movement of the weft thread toward the jet nozzle, so that when said reed holder moves in the downstream direction toward a first extreme position, the beating and the weft cutting are carried out, and when said reed holder then moves in the upstream direction and comes to a second extreme position, the weft picking is actually carried out,

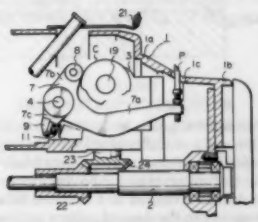
a weft pull-back device which catches the weft thread extending between said weft gripper and said jet nozzle when said reed holder is positioned in the vicinity of said first extreme position, and holds the same for a predetermined period of time when said reed holder moves in the upstream direction toward said second extreme position after completing the beating and the weft cutting.

4,481,983

WEFT RESERVOIR FOR FLUID-JET LOOMS

Yujiro Takegawa, Ishikawa, Japan, assignor to Tsudakomo Kogyo Kabushiki Kaisha, Japan

Filed May 4, 1983, Ser. No. 491,562
Claims priority, application Japan, May 10, 1982, 57-77985
Int. Cl.³ B65H *51/20*
U.S. Cl. 139—452 **15 Claims**



1. A weft reservoir for fluid jet looms in which weft is reserved under pin control comprising a reservoir drum made up of an upstream side conical section and a downstream side cylindrical section, a yarn guide rotatable about said reservoir drum for supply of weft taken from a given source of supply, a control pin annexed to said reservoir drum with its point

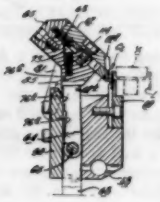
being directed to an operative position taken on said conical section of said reservoir drum, and means for driving said control pin for a reciprocal movement substantially in a plane normal to the axis of said reservoir drum between said operative position and a stand-by position in synchronism with loom running in such a manner that said control pin recedes from said operative position to said stand-by position upon initiation of weft insertion for delivery of weft reserved on its upstream side, and after a short dwell, advances again to said operative position from said stand-by position instantly after said initiation of weft insertion.

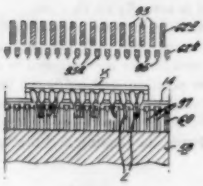
4,481,984

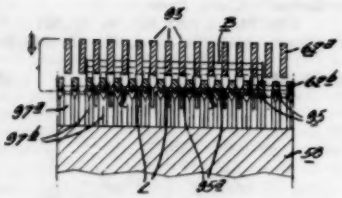
ELECTRONIC COMPONENT LEAD STRAIGHTENING DEVICE AND METHOD

Frank V. Linker, Broomall, Pa., assignor to American Tech Manufacturing Inc., Glenolden, Pa.

Filed Mar. 29, 1982, Ser. No. 363,128
Int. Cl.³ B21F *1/02*
U.S. Cl. 140—147 **9 Claims**







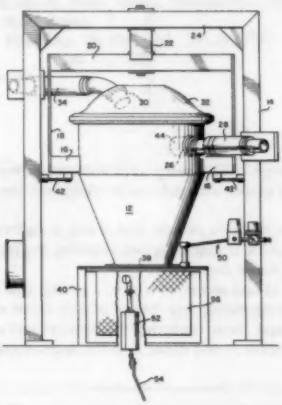
1. Mechanism for aligning leads of electronic devices having a body portion and a plurality of leads extending from the body portion comprising at least one separator blade having a series of spaced alternating lands and grooves oriented to receive the leads of the device arranged and oriented in a pattern corresponding generally to the desired pattern and orientation of the leads in a conditioned device, a head assembly cooperatively associated with said separator blade comprising a floating blade having a series of teeth adapted to initially engage between adjacent leads of the device to orient the same in general relation to the grooves in the separator blade upon relative movement of said separator blade and head assembly, and a wiper blade having means operable for engaging the leads in the grooves of the separator plate upon said relative movement.

4,481,985

APPARATUS AND METHOD FOR WEIGHING FLUENT MATERIAL

Stephen Bruder, Budd Lake; Philip Higby, Towaco, and Edgar Roth, Dumont, all of N.J., assignors to Lee Heydenreich, Essex Falls, N.J.

Filed Feb. 24, 1983, Ser. No. 469,426
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—1 **8 Claims**



7. A method of weighing fluent material, comprising the steps of:

providing a fluent-material-receiving chamber;

providing a main frame;

providing a hanger frame;

providing a single pendent support for the hanger frame by pendently supporting the hanger frame from the main frame by coupling the hanger frame to the main frame through a load cell;

interposing flexure leaves between said hanger frame and said main frame to stabilize the pendent support of the hanger frame;

admitting fluent material into the chamber;

taking milli-volt output signals from the load cell; and

translating the signals into indicia representative of the weight of the fluent material admitted into the chamber.

4,481,986

METHOD AND APPARATUS FOR MAKING CARBONATED BEVERAGES

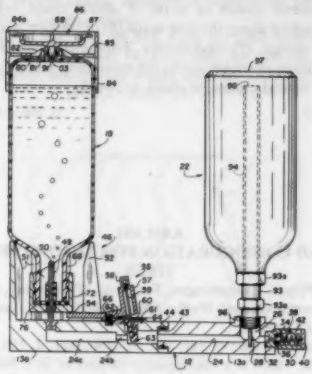
Louis B. Meyers, 753 Cornwell Ave., Malverne, N.Y. 11565

Filed Sep. 13, 1982, Ser. No. 417,225
Int. Cl.³ C02D *1/00*; B01F *3/04*
U.S. Cl. 141—4 **15 Claims**

1. In an apparatus for making carbonated beverages,

a supply of gas under pressure, and a container of liquid having an inlet connected with said gas supply to receive the gas therefrom for carbonation and pressurization of the liquid, means on said container spaced from said inlet operable to vent the gas from said container during the supply of the gas thereto so that as the gas vents from said

container it agitates the liquid in said container to cause the liquid to change its surfaces presented to the supplied



gas for more complete contact and saturation with the gas thereby to enhance the fuller carbonation of the liquid.

4,481,987

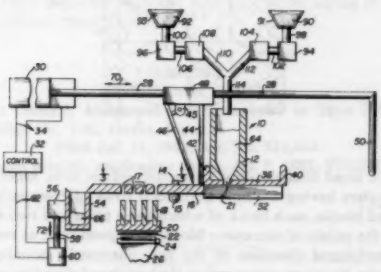
METHOD FOR DISPENSING FINE POWDERS

James A. Burns, Elizabeth, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Continuation-in-part of Ser. No. 380,505, May 21, 1982,. This application Jan. 28, 1983, Ser. No. 461,849

Int. Cl.³ B65B *1/04*

U.S. Cl. 141—12 **7 Claims**



1. A method for dispensing in a precisely controlled manner micro quantities of a plurality of reagent powders simultaneously into a plurality of containers, characterized by the steps of

(a) selecting portions of two or more individual reagent powders to be dispensed;

(b) individually sifting each reagent powder from said selecting step through a set of sifters to obtain each reagent powder in a form wherein the individual particles thereof are of the same size;

(c) combining said individual reagent powders obtained from said sifting step into a single portion of a plurality of reagent powders; and

(d) depositing micro quantities of said combined reagent powders from said combining step into a plurality of microcontainers.

4,481,988

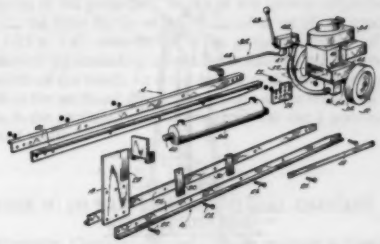
LOG SPLITTER

Gary E. Watson, and James R. Doornek, both of Mequon, Wis., assignors to Douglas Dynamics, Inc., Milwaukee, Wis.

Filed Nov. 14, 1983, Ser. No. 551,021

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 A **24 Claims**



1. A log splitter comprising

a frame generally in the shape of a right triangle, said frame including

an elongated horizontal member forming a first leg of said right triangle, said elongated horizontal member having a longitudinal axis and including a first end, a second end, and an upper surface adapted to support a log,

an elongated second member forming a hypotenuse of said right triangle and being positioned below said elongated horizontal member, said elongated second member including a first end and a second end, said first end of said elongated second member being fixedly attached to said first end of said elongated horizontal member, said second end of said elongated second member being spaced below said second end of said elongated horizontal member such that said elongated second member and said elongated horizontal member form an acute angle, and said second end of said elongated second member being adapted to rest on a supporting surface, and

a wedge member including upper and lower portions, said upper portion of said wedge member extending upwardly from said second end of said elongated horizontal member and having a splitting edge, said splitting edge being generally perpendicular to the longitudinal axis of said elongated horizontal member and facing said first end of said elongated horizontal member, and said lower portion of said wedge member forming a third leg of said right triangle and being secured to said second end of said elongated horizontal member and to said second end of said elongated second member and supporting said second ends in rigidly spaced apart relation, and

ram means for pushing a log along said upper surface of said elongated horizontal member toward said splitting edge of said wedge member for splitting the log with said wedge member.

4,481,989

TREE STUMP EXTRACTOR

Edwin L. Peters, Blountstown, Fla., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Sep. 20, 1983, Ser. No. 533,535

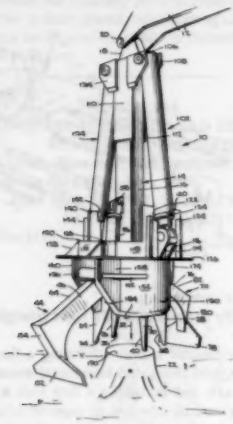
Int. Cl.³ A01G *23/06*

U.S. Cl. 144—335 **37 Claims**

1. A tree stump extractor comprising, a frame including locating means for locating said frame in a predetermined position on a tree stump, shearing means pivotable with respect to said frame for movement from a first limit position relative to said frame to a second limit position relative to said frame, first actuating means connected to said frame and said shearing means for pivoting said shearing means relative to said frame, and thrust means moveable with respect to said frame in a first

direction for engagement with said shearing means to urge said shearing means to move toward said second limit position.

33. A method for extracting the stump of a tree from the ground, the tree stump containing lateral roots and a tap root, comprising locating annular cutter means around the periphery of the tree stump in a position substantially coaxial with the



axis of the tree stump, forceably moving lateral cutter means from a position above the ground into the ground to laterally shear the tap root below ground, forceably moving the annular cutter means longitudinally of the tree stump into the ground to shear the lateral roots in the ground and lifting the tree stump from the ground whereby it is extracted without the tap root and the lateral roots.

4,481,990

DEVICE FOR TIRE PROTECTION AND/OR SKID PROTECTION FOR VEHICLE TIRES

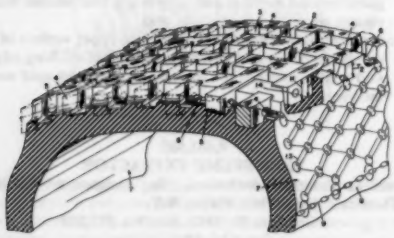
Hansjörg W. Rieger, Aalen, and Erhard A. Weidler, Aalen-Unterkochen, both of Fed. Rep. of Germany, assignors to RUD-Kettenfabrik Rieger & Dietz Gmbh u. Co., Aalen, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,552

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 2838048

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—172 **29 Claims**



1. In a device for protecting tires and/or preventing skidding of tires, the tread of said tires defining recesses for receiving tire protectors or skid protectors and grooves for accommodating retaining strands, said retaining strands being adapted to hold said protectors in said recesses and said retaining strands being movable relative to said protectors,

the improvement comprising:

each of said protectors (5) being held in said respective recess (3) by at least two retaining strands (6) which pass the tire tread surface substantially transversely to the direction of running of the tire and which are connected to lateral chains or parts of lateral chain networks (7) extending along the side walls (8) of the tire, and a tensioning device (9) operatively associated with said lateral chains or chain networks for tensioning said protectors via said lateral chains or chain networks.

4,481,991

TREAD CONFIGURATION FOR MOTOR VEHICLE TIRES

Henner Pieper, Langenhagen, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

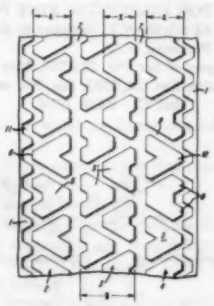
Continuation-in-part of Ser. No. 365,030, Apr. 2, 1982, Pat. No. 4,383,568, which is a continuation-in-part of Ser. No. 177,858, Aug. 14, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 419,797

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 7923582[U]; Dec. 19, 1981, 8137115[U]

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ B60C *11/00*

U.S. Cl. 152—209 R **7 Claims**

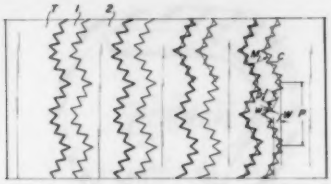


1. A tread configuration for motor vehicle tires, especially spare tires having multiple peripheral rows of essentially V-shaped blocks, each block of which has a point and two ends, with the points of successive blocks in a given row, as seen in the peripheral direction of the tire, alternately pointing in opposite directions transverse to the peripheral direction of the tire, at least three peripheral rows of V-shaped blocks being respectively separated from one another by linearly extending peripheral grooves, with the width of the two axially outer rows of blocks essentially corresponding to the axial dimension of each of said blocks individually in the respective outer row, while the successive blocks of the middle row of blocks are laterally offset relative to each other in such a way that the collective width of said middle row is approximately 1.1 to 1.8 times the axial dimension of each of said blocks individually in the respective middle row and the collective width of the middle row is larger than the width of the outer rows, the improvement therewith comprising that the depth of inclined grooves located between successive blocks of said middle row is essentially considerably less than the depth of the remaining inclined grooves located between the blocks in the outer rows and of the peripheral grooves located between the rows of blocks.

4,481,992
HEAVY DUTY RADIAL TIRE

Hiroyoshi Takigawa, Kodaira, and Hiroshi Ogawa, Higashiyamato, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 268,519, May 29, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,385
Claims priority, application Japan, Jun. 10, 1980, 55-77084
Int. Cl.³ B60C *11/06*
U.S. Cl. 152—209 R **4 Claims**

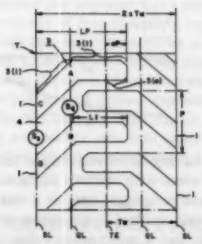


1. A heavy duty radial tire comprising; a tread and a rigid reinforcing structure just under the tread, said reinforcing structure comprising a carcass having at least one ply having cords arranged therein in the substantial radial plane of the tire, and a belt comprising at least two cord layers arranged on the outer side of the carcass so as to be crossed with each other at a relatively small angle with respect to the equatorial line of the tire, and said tread having a complete rib-type tread pattern with at least one zigzag main groove extending continuously on the tread along its circumferential direction and at least two zigzag ribs separated from each other in the lateral direction by the main groove and adjacent thereto and extending continuously on the tread along its circumferential direction; a zigzag being formed in both ridges of a set of ridges themselves defining one of said zigzag ribs positioned adjacent the main groove; the zigzag of said zigzag ridges being continuous along the circumferential direction of the tread, and a pitch and an amplitude of said zigzag in said ridge being constant along the circumferential direction of the tread and being 1/10–1/5 times and 1/10–¼ times the pitch and amplitude of the zigzag of said main groove, respectively.

4,481,993
PNEUMATIC TIRES

Sumio Ohnishi, Amagasaki, Japan, assignor to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed Jul. 11, 1983, Ser. No. 512,654
Claims priority, application Japan, Jul. 9, 1982, 57-120198
Int. Cl.³ B60C *11/00*
U.S. Cl. 152—209 B **1 Claim**

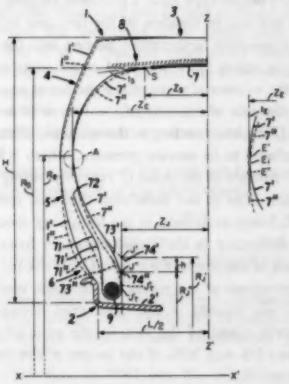


1. A pneumatic tire having nominal rim size less than 762 mm (30 inches), flatness ratio less than 80% and a tread pattern including a plurality of lugs separated each other by a groove, said lugs comprising slanting portions which inclines relative to the equatorial line of the tire and extends from each side edge of the tread toward the each ¼ position of the tread width and transverse portions which turns toward the equatorial line and terminates in the opposite area across the equatorial line, the transverse portion of the left-hand lug alternating with the transverse portion of the right-hand lug and overlapping each other in the circumferential direction of the tire, the groove edges being curved with the radius of curvature not exceeding 1 mm, overlapped ratio eP/Tw of the lugs being within the range of 0.30 to 0.38, the ratio Lt/2×Tw being 0.25 to 0.45, the coefficient of the projective length of the groove edges being 25 to 32, the ratio Ss/Sq of the sectional areas of the grooves being 1.25 to 1.65, wherein eP is the projective length of the extension of lug extending across the equatorial line, Tw is the half width of the tread, Lt is the length of the transverse portion, Ss is the sectional area of the groove at the tread side line and Sq is the sectional area of the groove at the ¼ position of the tread width.

4,481,994
TIRE WITH PRESTRESSED RADIAL CARCASS REINFORCEMENT

Jean Pommier, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 281,976, Jul. 10, 1981, abandoned, which is a continuation of Ser. No. 100,829, Dec. 6, 1979, abandoned. This application Mar. 7, 1983, Ser. No. 473,129
Claims priority, application France, Dec. 15, 1978, 78 35731
Int. Cl.³ B60C *3/00, 9/18*
U.S. Cl. 152—353 R **7 Claims**



1. A tire formed of a tread, two shoulders, two sidewalls and two beads and having a carcass reinforcement capped by a tread reinforcement, the carcass reinforcement consisting essentially of at least one ply of radial wires or cables anchored to at least on bead ring in each bead, the tread reinforcement consisting of at least two plys of wires or cables which are parallel to each other in each ply and crossed from one ply to the other, the tire being characterized by the fact that, the tire being considered in radial cross-section, mounted on its service rim and not under load,

(a) the mean meridian fiber of the carcass reinforcement of the uninflated tire and the mean meridian fiber of the carcass reinforcement of the tire inflated to its service pressure have a point of intersection (E_i) which is located between a point (E′) of the mean meridian fiber of the carcass reinforcement of the uninflated tire and a point (E″) of the mean meridian fiber of the carcass reinforcement of the inflated tire at which said points (E′, E″) the mean meridian fibers have a common tangent perpendicular to the axis of rotation of the tire,

(b) the mean meridian fiber of the carcass reinforcement of the uninflated tire has an upper segment, contained be-

tween the point (S) where the carcass reinforcement becomes parallel to the tread reinforcement and said point of intersection (E_i), which is located radially and axially outward of a corresponding upper segment of the mean meridian fiber of the carcass reinforcement of the inflated tire,

(c) the mean meridian fiber of the carcass reinforcement of the uninflated tire has a lower segment, contained between said point of intersection (E_i) and the point (J'_T) where the carcass reinforcement becomes parallel to the bead ring, which is located radially outward and axially inward of a corresponding lower segment of the mean meridian fiber of the carcass reinforcement of the inflated tire,

(d) the mean meridian fiber of the carcass reinforcement follows traces defined by the relationship $\cos\phi=(R^2-R_e^2)/(R_s^2-R_e^2)$, at least between the point (S) where the carcass reinforcement becomes parallel to the tread reinforcement and the zone of the bead, the traces of the mean meridian fiber of the uninflated tire and of the tire inflated to its service pressure having, on the one hand, in common the point (S) where the carcass reinforcement becomes parallel to the tread reinforcement, these traces being furthermore located at the same axial distance from the equatorial plane of the tire to said points (E', E'') where they have a common tangent perpendicular to the axis of rotation of the tire, and these traces or their extensions furthermore passing into the zone of the bead via points (J', J'') located at the same axial distance from the equatorial plane of the tire but at a radial distance from the axis of rotation of the tire, with respect to the point (J'') corresponding to the mean meridian fiber of the tire inflated to its service pressure, which is less than the radial distance of the point (J') corresponding to the mean meridian fiber of the uninflated tire; said terms ϕ, R, R_e and R_s being as defined in the foregoing specification,

(e) the difference in the radial distances from the axis of rotation of the tire to the points (J', J'') of the traces or of the extensions of the traces of the mean meridian fibers, which are located at the same axial distance from the equatorial plane of the tire, in the zone of the bead, is between 2% and 20% of the height of the tire on its service rim,

(f) the shape of the tire, and more particularly the shape of its carcass reinforcement, mounted on its service rim, not inflated and not under load, is obtained by vulcanizing the tire on a rim of a width equal to or less than the width of its service rim in a vulcanization mold corresponding to said shape,

(g) the carcass reinforcement, at least between the point (S) where it becomes parallel to the tread reinforcement and the point (J'_T) where it becomes parallel to the bead ring, has a relative elongation of less than 0.5%, and preferably less than 0.2%, under a tensile force equal to 10% of its ultimate tensil strength, and

(h) the length of the mean meridian fiber of the carcass reinforcement of the uninflated tire and the length of the mean meridian fiber of the carcass reinforcement of the inflated tire differ from each other by at most 1%, at least between the point (S) where the carcass reinforcement becomes parallel to the tread reinforcement and points (J'_T) and (J''_T), respectively, where the carcass reinforcement becomes parallel to the bead ring.

4,481,995

PNEUMATIC RADIAL TIRES

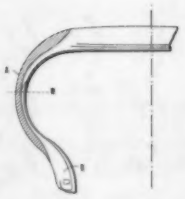
Masaki Ogawa; Yasushi Hirata; Tatsuo Fujimaki; Tomoharu Yamada, all of Tokyo, and Seisuke Tomita, Saitama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1982, Ser. No. 417,943

Claims priority, application Japan, Sep. 14, 1981, 56-143994

Int. Cl.³ B60C *13/00, 9/02*

U.S. Cl. 152—356 R **5 Claims**



1. A pneumatic radial tire having sidewalls, the rubber composition of said sidewalls comprising, based on 100 parts by weight of rubber, 20 to 90 parts by weight of butadiene-piperylene copolymer and 80 to 10 parts by weight of at least one rubbery diene polymer selected from the group consisting of natural rubber, synthetic polyisoprene rubber, polybutadiene rubber, butadiene-styrene copolymer rubber, ethylene-propylene-diene ternary copolymer rubber and acrylonitrile-butadiene copolymer rubber, wherein said butadiene-piperylene copolymer has a 1,3-pentadiene content of 15 to 50% by weight of said butadiene-piperylene copolymer.

4,481,996

FATIGUE RESISTANT CABLES

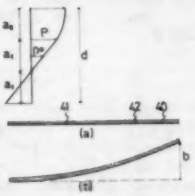
Marc De Bondt, Harelbeke; Urbain D'Haene, Kuurne, and Paul Dambre, Kemmel, all of Belgium, assignors to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Feb. 4, 1982, Ser. No. 345,585

Claims priority, application United Kingdom, Feb. 6, 1981, 8103671

Int. Cl.³ B60C *9/00;* **C21D** *7/00*

U.S. Cl. 152—359 **4 Claims**



1. A steel cable having improved fatigue resistance, comprising a number of wires with smooth surfaces having substantially their complete peripheral zone in a state of substantially uniformly distributed residual compressive stress wherein said compressive stress has a substantial value in a longitudinal direction, said substantial value of compressive stress for a given wire of said cable being determined by calculating a ratio of the diameter of said wire to the radius of curvature of said wire after selective etching wherein said ratio is at least 2×10^{-4}, said wires having a tensile strength of at least about 2,000 Newtons per square millimeter and a maximum diameter of about 0.80 millimeters.

4,481,997

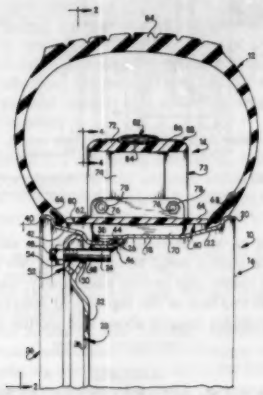
TIRE AND RIM COMBINATION WITH SAFETY INSERT

Don S. Strader, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 293,099, Aug. 17, 1981, abandoned, which is a continuation-in-part of Ser. No. 192,337, Sep. 29, 1980, Pat. No. 4,327,791. This application Nov. 5, 1982, Ser. No. 439,565

Int. Cl.[3] B60B *25/08, 25/10, 25/20*

U.S. Cl. 152—401 12 Claims



12. A safety tire and wheel assembly comprising a vehicle wheel including a wheel rim having axially spaced bead flanges, and a rim base; a tire having axially spaced bead toes and a circumferential tire tread; and safety means including an axially incompressible first portion extending circumferentially around said rim and having axially spaced side edges clamping said bead toes against said bead flanges such that said tire tread is spaced radially outwardly of said rim base to define a tire cavity, said wheel rim including means for inflating said tire cavity and means for preventing inflation of said tire cavity in the event of improper assembly of said safety tire and wheel assembly; said wheel rim comprising a first rim segment including one of said bead flanges, a second rim segment including the second of said bead flanges adapted to be axially assembled to said first rim segment, annular sealing means adapted to be disposed between opposing portions of said first and second rim segments and means for releasably clamping said second rim segment onto said first rim segment with said annular sealing means captured in compression between said portions of said rim segments for sealing said tire cavity, said means for preventing inflation comprising air bleed passage means in one of said first and second rim segments for venting said cavity to atmosphere in the event of loss of sealing engagement at said sealing means; said clamping means being adapted to engage and exert clamping stress on said second rim segment over a dimension in the axial direction of said first rim segment which is sufficient to permit loss of sealing pressure at said sealing means prior to loss of clamping engagement at said clamping means, permitting air leakage past said sealing means through said air bleed passage means to atmosphere.

4,481,998

DEVICE FOR OPERATING A PULL CORD

Stanley L. Strandberg, 11580 Hesby St., North Hollywood, Calif. 91601, and Jerome F. Bloch, 5240 Zelzah Ave., Encino, Calif. 91316

Filed Oct. 22, 1982, Ser. No. 436,138

Int. Cl.[3] A47K *11/06*

U.S. Cl. 160—344 17 Claims

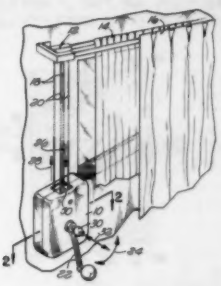
1. A device for applying a tensile force to a flexible cord, comprising:

a base;

a drive wheel rotatably mounted to the base and engageable with the cord between first and second portions of the cord such that the cord extends substantially around the drive wheel;

first and second roller means within the plane of the drive wheel and engageable with the first and second portions of the cord, respectively, to guide them outwardly from the guide wheel;

means for coupling the first and second roller means for movement within the plane of the drive wheel between



first and second alternate conditions such that, in each of the conditions, tension of one of said portions of the cord acts to move the respective roller means away from the drive wheel so as to urge the other roller means and the other portion of the cord against the drive wheel in frictional engagement therewith; and

means for selectively rotating the drive wheel in either of two opposite directions to tension one of said portions of the cord.

whereby said one portion of the cord can be drawn toward the device by rotation of the drive wheel.

4,481,999

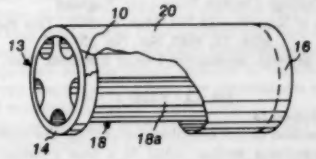
METHOD OF FORMING A THIN UNBACKED METAL FOIL

David V. Duchane, Los Alamos, and Barry L. Barthell, Tesuque, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 23, 1982, Ser. No. 351,378

Int. Cl.[3] B22C *7/02, 9/24;* B22D *23/00, 29/00*

U.S. Cl. 164—6 2 Claims



1. A method of forming a thin unbacked metal foil, comprising the steps of:

(a) forming on a suitable mold a film comprising polyvinyl alcohol and a plasticizer;

(b) transferring said film to a supporting structure;

(c) shrinking said film about said supporting structure by immersing said supporting structure and said film in a solvent selected to preferentially dissolve said plasticizer without dissolving said polyvinyl alcohol in said film;

(d) depositing a continuous layer of metal at least approxi-

mately 1700 Angstroms thick onto said film by vacuum vapor deposition; and

(e) immersing said film with said layer of metal deposited thereon in a suitable solvent to dissolve said film.

4,482,000

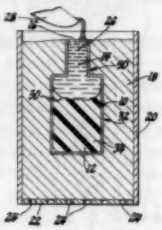
VARIABLE-PERMEABILITY PATTERN COATING FOR LOST FOAM CASTING

Reinhold J. Reuter, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 26, 1982, Ser. No. 402,129

Int. Cl.³ B22C *9/02*

U.S. Cl. 164—34 **6 Claims**



1. A coated pattern for casting reduced porosity metal by a lost foam process comprising

a consumable pattern adapted to be decomposed and duplicated by molten metal to form a casting, said pattern decomposition forming vapors that produce pores in the casting when entrapped in the metal, and

a coating applied to the pattern and formed of a predominantly refractory particulate matrix and polymeric particles vaporizable at metal casting temperatures, said polymeric particles being distributed within the matrix in a manner suitable to delay vaporization thereof as the result of heat from pattern-duplicating molten metal during casting,

said coating with said polymeric particles having a relatively low permeability to pattern decomposition vapors effective to reduce turbulence in the molten metal during casting, but forming a residual coating upon vaporization of said polymeric particles wherethrough vapors readily vent to avoid entrapment within the metal.

4,482,001

HOT CHAMBER DIE-CASTING

Dennis Smedley, Walsall, and Noel C. Spare, Naunton Beauchamp, nr. Pershore, both of England, assignors to Magnesium Castings Limited, Worcester, England

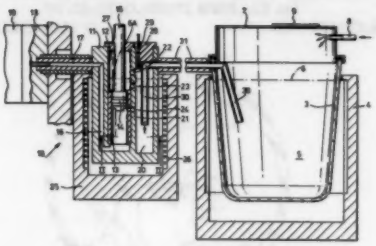
Division of Ser. No. 126,352, Mar. 3, 1980,. This application Mar. 11, 1982, Ser. No. 357,002

Claims priority, application United Kingdom, Mar. 21, 1979, 7909934

Int. Cl.³ B22D *17/04*

U.S. Cl. 164—113 **3 Claims**

1. A method of hot chamber die-casting, the method comprising supplying molten metal to a shot cylinder with an upright axis and causing a piston to perform a downward working stroke from an upper to a lower position in said cylinder to force a shot of said molten metal downwards out of said cylinder and upwards through an injection duct positioned alongside said cylinder and through a substantially horizontal nozzle into a die, the improvement comprising the steps of providing a reservoir of said molten metal closed from the atmosphere by a closure member and separated from the interior of said cylinder by a partition wall, providing a first passageway in said partition wall interconnecting said reservoir and said cylinder interior at a position spaced above the bottom of said reservoir and adjacent to but below said piston when in said upper position, providing a second passageway interconnecting said reservoir and said cylinder interior at a position spaced below the top of said reservoir and above said piston when in said upper position; supplying said molten metal to said reservoir from a separate source to maintain a level of said



molten metal in said reservoir wholly above said second passageway; said molten metal being supplied into said reservoir at a position below said second passageway; and providing a protective atmosphere in the top of said reservoir and in the top of said cylinder interior above said molten metal level.

4,482,002

RACK-CHANGING APPARATUS FOR A CONTINUOUS CASTING INSTALLATION

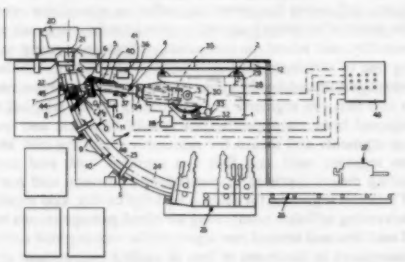
Hans J. Reuter, Kürten-Biesfeld, Fed. Rep. of Germany, assignor to Mecan Arbed S.a.r.l., Luxembourg, Luxembourg

Continuation of Ser. No. 207,078, Nov. 14, 1980, abandoned. This application Jun. 21, 1983, Ser. No. 505,897

Claims priority, application Luxembourg, Nov. 16, 1979, 81905

Int. Cl.³ B22D *11/128*

U.S. Cl. 164—442 **3 Claims**



1. In a continuous casting installation having a casting floor, at least one tundish on said casting floor, and at least one casting line receiving molten metal from said tundish and forming a continuous casting therefrom, said casting line comprising a mold positioned below said tundish and a plurality of guide and support racks in the form of arc segments disposed below said casting floor and receiving said casting for transferring said casting from said mold to a horizontal stretch, the improvement which comprises an apparatus for removing said racks from and replacing such racks in said line, said apparatus comprising:

a track below said casting floor and above said stretch and transverse thereto;

a carriage mounted on said track for displacement transversely to said stretch below said floor and above said stretch;

an extensible and retractable outrigger arm swingably

mounted on said carriage for movement in a vertical plane about a horizontal axis on said carriage, said outrigger arm having a free end adapted to be selectively juxtaposed with said racks;

a support and clamping mechanism pivotally mounted on said free end of said outrigger arm about a further horizontal axis and engageable with a rack upon juxtaposition of said free end therewith whereby the engaged rack can be withdrawn from said line and moved transversely to said line upon displacement of said carriage, said mechanism including a support arm engageable under a pin projecting laterally from a rack and a clamping arm adapted to brace downwardly against another pin projecting laterally from the same rack and below the first mentioned pin, said support and clamping arms being relatively swingable;

first drive means operatively connected with said carriage for independently displacing same along said track;

second drive means on said carriage connected with said outrigger arm for extending and retracting same relative to said carriage by a distance equal at least to the width of said racks;

third drive means on said carriage engaging said outrigger arm for angularly displacing the outrigger arm about the horizontal axis through at least the arc length of all the segments of said line;

fourth drive means on said carriage operatively disposed between said mechanism and said outrigger arm for angularly displacing said mechanism about the further horizontal axis through at least 90°; and

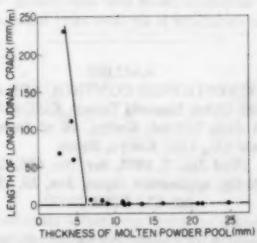
fifth drive means on said carriage for clamping said mechanism onto a rack to be engaged thereby by actuating said clamping arm to relatively swing said support and clamping arms.

4,482,003

METHOD FOR CONTINUOUS CASTING OF STEEL

Taketo Nakano; Masao Fuji, both of Sagamihara, and Shozo Mizoguchi, Oita, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,446
Claims priority, application Japan, Apr. 28, 1981, 56-63266
Int. Cl.³ B22D *11/16*
U.S. Cl. 164—452 **4 Claims**



1. In a method for continuous casting of steel by pouring molten steel into a continuous casting mold, withdrawing the casting downwardly from the mold at a withdrawal speed V in m/min., oscillating said casting mold vertically during the withdrawal, and providing a layer of molten powder on top of the molten steel in the casting mold, the improvement which comprises maintaining the thickness of the molten powder layer according to the formula:

$$P \geqq m - 1000 \times V \times T + a$$

wherein:

P is the thickness in mm of the molten powder layer;

a is the ripple amplitude in mm of any ripples in the surface of the molten steel within said mold;

T is a negative strip period of time in min. during which the speed of descent of the mold is greater than the withdrawal speed V; and

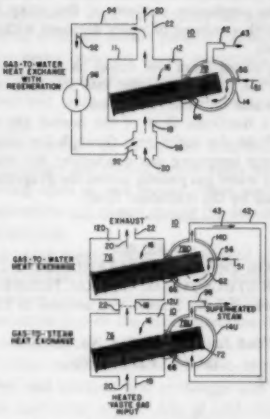
m is the distance in mm of descent of said mold during time T.

4,482,004

WASTE HEAT BOILER

George M. Grover, Los Alamos, N. Mex., assignor to Qdot Corporation, Garland, Tex.

Filed Nov. 9, 1977, Ser. No. 849,987
Int. Cl.³ F28D *15/00*; F22B *3/02*
U.S. Cl. 165—1 **7 Claims**



2. A method of producing superheated steam by the recovery of heat energy from a stream of heated waste gas comprising the steps:

discharging the stream of heated waste gas through upstream and downstream convection heat transfer chambers which are connected in series fluid communication with each other;

producing saturated steam in a first boiler tank by transferring heat energy from the heated waste gas stream to a volume of water contained within the first boiler tank by means of a first array of heat pipes each having an evaporator section disposed in the flow path defined by the downstream convection heat transfer chamber, a condenser section disposed in heat transfer relation with the volume of water in the first boiler tank, and a volume of working fluid carried through each heat pipe of the first array in closed cycle circulation between the downstream evaporator and condenser sections in response to heat energy transfer to and from the downstream evaporator and condenser sections, respectively;

discharging saturated steam produced by the first boiler tank into a second boiler tank; and,

producing superheated steam in the second boiler tank by transferring heat energy from the heated waste gas stream to the saturated steam discharged into the second boiler tank by means of a second array of heat pipes each having an evaporator section disposed in the flow path defined up the upstream convection heat transfer chamber, a condenser section disposed in heat transfer relation with the saturated steam discharged in the second boiler tank, and a volume of working fluid carried through each heat pipe of the second array of heat pipes in closed cycle circulation between the upstream evaporator and condenser sections in response to heat energy transfer to and from

the upstream evaporator and condenser sections, respectively.

7. A method of producing steam by the recovery of heat energy from a stream of heated waste gas comprising the steps:

discharging the stream of heated waste gas over the evaporator sections of an array of heat pipes each having an evaporator section disposed within a convection heat exchange chamber, including an inlet port for receiving the flow of heated waste gas and an outlet port for discharging the heated waste gas stream after it has passed over the evaporator section, a condenser section disposed within a steam vessel, and a volume of working fluid carried through the heat pipe in closed cycle circulation between the evaporator section and the condenser section in response to heat energy transfer to and from the evaporator and condenser sections, respectively;

exposing the condenser sections of the array in intimate contact with a volume of water disposed within the pressure vessel;

discharging steam from the vessel as it is produced and replacing the water converted into steam by discharging makeup water into the vessel; and

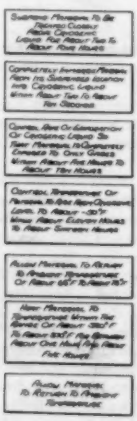
circulating a fractional flow of the heated gas stream discharged from the outlet port through the inlet port in a regenerative operating mode whereby the mass flow of the heated waste gas passing across the evaporator section is increased by the fractional flow.

4,482,005

PROCESS FOR TREATING MATERIALS TO IMPROVE THEIR STRUCTURAL CHARACTERISTICS

Joseph E. Voorhees, Lake Winola, Pa., assignor to Endure, Inc., Dallas, Pa.

Filed Jan. 3, 1984, Ser. No. 567,758
Int. Cl.³ F25B *13/00*
U.S. Cl. 165—2 **34 Claims**



1. A process for treating a material to improve its structural characteristics, comprising the steps of:

A. suspending the material closely above a cryogenic liquid for between about two hours and about four hours;

B. after said suspending step, completely immersing the material from its suspended location into the cryogenic liquid within about two seconds to about ten seconds;

C. after said immersing step, controlling the rate of evaporation of the cryogenic liquid so that the material is completely exposed to only gases within about five hours to about ten hours;

D. after the material is completely exposed to only gases, controlling the temperature of the material to rise from the cryogenic level to about −50° F. within about eleven hours to about sixteen hours;

E. after the temperature of the material rises to about −50° F. in said immediately preceding controlling step, allowing the material to return to ambient temperature of between about 65° F. and about 70° F.;

F. after the temperature of the material reaches ambient temperature in said allowing step, heating the material to an elevated temperature within the range of about 330° F. to about 370° F. for between about one hour and about five hours; and

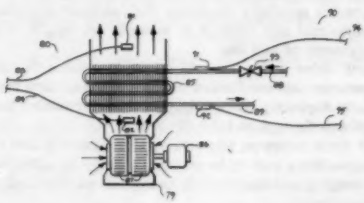
G. allowing the material to return to ambient temperature.

4,482,006

THERMAL ENERGY METER

Cary R. Anderson, 428 E. Chapel St., Rockton, Ill. 61072

Division of Ser. No. 183,433, Sep. 2, 1980, Pat. No. 4,393,919.
This application Feb. 23, 1983, Ser. No. 469,126
Int. Cl.³ F28F *27/00*
U.S. Cl. 165—11 R **12 Claims**



1. A device for monitoring the thermal energy used by a single unit of a multi-unit building having a central space conditioning system said device comprising an energy monitoring circuit having a temperature sensor thermally coupled to the entering air flow of a heat exchanger utilizing an air moving blower fan, a temperature sensor thermally coupled to the exiting air flow of said heat exchanger, a differencing means to determine the temperature difference between said temperature sensors, and a recording and display means for the totalization and reading of the energy consumption monitored wherein the amplification of said differencing means is varied to account to variations in air flow rates from said blower fan.

4,482,007

AIR CONDITIONER CONTROL APPARATUS

Akiro Yoshimi, Oubu; Masashi Takagi, Kariya; Masao Sakurai, Oubu, and Akio Takemi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 7, 1983, Ser. No. 456,429
Claims priority, application Japan, Jan. 20, 1982, 57-8141
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—21 **1 Claim**

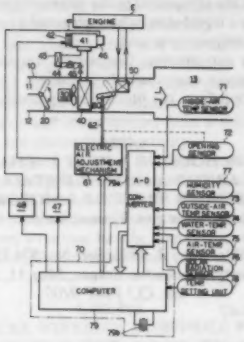
1. An apparatus for controlling an air conditioner having a refrigeration cycle including an evaporator disposed in an air passage for supplying air to an area to be air-conditioned and a compressor having a mechanism for varying a volume of discharge from the compressor, a heater disposed in the air passage, and a mechanism for adjusting the amount of heat generated by the heater, said apparatus comprising:

first signal generating means responsive to a humidity in the area to be air-conditioned for producing a first signal indicative of the humidity;

second signal generating means responsive to a degree of cooling required in the area to be air-conditioned for producing a second signal indicative of the degree of cooling;

third signal generating means responsive to a temperature

related to a stream of air discharged from the evaporator for producing a third signal indicative of the temperature; fourth signal generating means responsive to a temperature related to a capability of the heater for producing a fourth signal indicative of the last-mentioned temperature; and



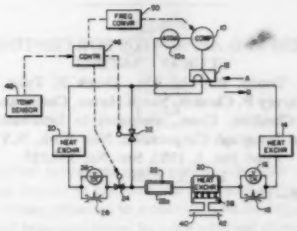
means responsive to said first and second signals for actuating the mechanism for varying the volume of discharge from the compressor and responsive to said second, third and fourth signals for actuating the mechanism for adjusting the amount of heat generated by the heater.

4,482,008

AIR CONDITIONER OPERABLE IN A ROOM COOLING MODE AND A ROOM WARMING MODE USING EITHER OUTDOOR AIR OR A SEPARATE HEAT SOURCE AS A SOURCE OF HEAT

Tamotsu Nomaguchi, Minoo, and Masahiro Sakai, Kobe, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,838
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—29 **19 Claims**



1. An airconditioner selectively operative in a room cooling mode, a first room warming mode using the outdoor air as a heat source, and a second room warming mode using a heat generator means as a heat source, the airconditioner comprising:

compressor means for compressing a refrigerant;

a refrigerant circuit composed only of:

an indoor heat exchanger disposed in heat exchange relationship with the indoor air in the room to be airconditioned for being operated as an evaporator in said room cooling mode of operation and a condenser in said first and second room warming modes of operation;

a first parallel connected component connected in series with said indoor heat exchanger and having first pressure reducing means for reducing the pressure of the refrigerant flowing therethrough and a first bypass means connected in parallel with said first pressure reducing means and permitting flow of refrigerant only in a direction away from said indoor heat exchanger;

piping means connected in series with said first parallel connected component for holding refrigerant in its liquid phase during both said room cooling mode and said first room warming mode of operation;

a second parallel connected component connected in series with said piping means and having second pressure reducing means for reducing the pressure of the refrigerant passing therethrough and a second bypass means connected in parallel with said second pressure reducing means and permitting flow of refrigerant only in a direction toward said piping means;

an outdoor heat exchanger disposed in heat exchange relationship with the outdoor air and connected in series with said second parallel connected component for being operated as an evaporator in said room cooling mode of operation and a condenser in said first and second room warming modes of operation; and

a bypass connected in parallel with said outdoor heat exchanger and having bypass valve means therein for being open in said second room warming mode of operation and closed during the remaining modes of operation;

reversing valve means connected between said compressor and said refrigerant circuit at a point between said indoor and outdoor heat exchangers and for selectively directing refrigerant in one or the other direction through the refrigerant circuit;

control valve means connected in said refrigerant circuit between said outdoor heat exchanger and the end of the bypass connected on the side of said outdoor heat exchanger which is toward said indoor heat exchanger;

a separate heat exchanger connected in said refrigerant circuit for having refrigerant flowing therethrough when said bypass valve means is open and said control valve means is closed, said separate heat exchanger being for heating said refrigerant during said second room warming mode of operation and for holding refrigerant in its liquid phase during both said room cooling mode and said first room warming mode of operation;

said piping means having an internal volume substantially equal to only the difference between the internal volume of said outdoor heat exchanger and the internal volume of said separate heat exchanger;

heat generation means operatively associated with said separate heat exchanger and operable for imparting heat to said separate heat exchanger during said second room warming mode of operation;

refrigerant flow rate adjusting means connected to said compressor means and operable during said second room warming mode of operation for adjusting the flow rate of the refrigerant flowing into said separate heat exchanger during said second room warming mode of operation; and

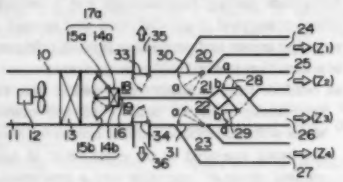
control means connected to said control and bypass valve means and to said refrigerant flow rate adjusting means for selectively placing them in their desired operating conditions according to whether the operation of said airconditioner is to be in said room cooling mode or said first or second room warming mode, whereby when said airconditioner is operated in said second room warming mode said outdoor heat exchanger is filled with liquid refrigerant so as to radiate little or no heat therethrough.

4,482,009

AUTOMOBILE AIR CONDITIONING SYSTEM

Masao Nishimura, Anjo; Masami Mori, Oobu, and Yasuhito Kai, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 9, 1982, Ser. No. 367,061
Claims priority, application Japan, Apr. 10, 1981, 56-54506
Int. Cl.³ F24F *7/00, 3/044;* F28F *9/22*
U.S. Cl. 165—41 **7 Claims**



1. An automobile air-condition system, comprising:

(a) first and second temperature control units arranged in two divided parts of a single ventilation unit for supplying conditioned air to a compartment, each of said temperature control units including a heat exchanger for heating and means for adjusting the amount of heat exchange of said heat exchanger, said first temperature control unit and said second temperature control unit producing first air flow and second air flow respectively which are temperature controlled independently;

(b) first air outlet communicated with a first air passage for supplying air to a first air-conditioning zone;

(c) second air outlet communicated with a second air passage for supplying air to a second air-conditioning zone;

(d) third air outlet communicated with a third air passage for supplying air to a third air-conditioning zone;

(e) fourth air outlet communicated with a fourth air passage for supplying air to a fourth air-conditioning zone; and

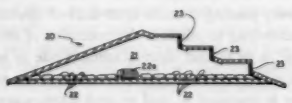
(f) selector means for connecting said first and second temperature control units to said first, second, third and fourth air outlets selectively, said selector means being movable between first and second positions, wherein in a first position of said selector means, said selector means conducts said first air flow to said first and second air outlets through said first and second air passages respectively, and conducts said second air flow to said third and fourth air outlets through said third and fourth air passages respectively, and in a second position of said selector means, said selector means conducts said first air flow to said first and third air outlets through said first and third passages respectively, and conducts said second air flow to said second and fourth air outlets through said second and fourth air passages respectively.

4,482,010

METHOD AND APPARATUS FOR STORING ENERGY

William A. Cordon, 1090 N. 1800 East, Logan, Utah 84321

Division of Ser. No. 185,353, Sep. 8, 1980, Pat. No. 4,367,788. This application Dec. 20, 1982, Ser. No. 450,996
Int. Cl.³ F28D *21/00*
U.S. Cl. 165—53 **7 Claims**



1. An insulating material comprising

a porous carrier material having voids therein forming reservoirs;

a phase-change compound substantially filling the voids of the porous carrier material particles until the porous carrier material particles are saturated but surface dry, whereby the compound in the reservoirs will change from a solid to a liquid state when subjected to a predetermined ambient temperature; and

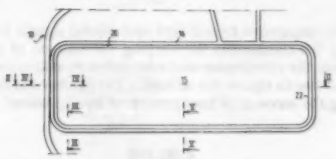
bag means surrounding the porous carrier material and phase-change compound held therein to prevent liquid evaporation from the phase change compound.

4,482,011

CASE FOR HOUSING A HEAT EXCHANGER, IN PARTICULAR FOR A HEATER INSTALLATION FOR THE PASSENGER SPACE OF A MOTOR VEHICLE

Maurice Jacquet, Maurepas, France, assignor to Valeo, Paris, France

Filed May 4, 1982, Ser. No. 374,793
Claims priority, application France, May 11, 1981, 81 09360
Int. Cl.³ F28F *9/00*
U.S. Cl. 165—67 **12 Claims**



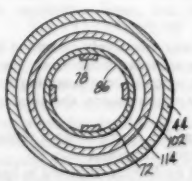
1. A molded, hollow case for a heat exchanger comprising a housing configured to support a heat exchanger therewithin in spaced nested relationship, combination support and sealing means integrally formed in the interior of said housing and including an inner peripheral portion positioned at at least one end of said housing configured to define an elastically deformable lip dimensioned to sealingly engage said heat exchanger when said heat exchanger is positioned within said housing and preclude undesired air leakage between said housing and said heat exchanger.

4,482,012

PROCESS AND APPARATUS FOR CONTINUOUS SLURRY CASTING

Kenneth P. Young, Ballwin, Mo.; Derek E. Tyler, Cheshire, Conn.; Harvey P. Cheskis, North Haven, Conn., and W. Gary Watson, Cheshire, Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 384,019
Int. Cl.³ F28F *13/14*
U.S. Cl. 165—146 **5 Claims**



1. A heat exchanger for removing heat from a molten material and forming a semi-solid slurry, said heat exchanger comprising:

first chamber means for containing said molten material;

means for controlling the amount of said heat extracted from said molten material and the cooling rate of said molten material, said controlling means comprising a plurality of

members formed from a material having a relatively low thermal conductivity lying in a plurality of circumferential planes;

each said circumferential plane having at least one of said members and an enclosing material having a higher thermal conductivity defining an effective heat transfer area defined by that portion of said circumferential plane not encompassing said at least one member;

said effective heat transfer area of a most upstream one of said planes being greater than said effective heat transfer area of a most downstream one of said planes; and

insulating means lying between adjacent ones of said circumferential planes and being formed from a material having a relatively low thermal conductivity,

whereby said molten material is cooled so as to initiate growth of primary phase particles of said molten material and to form sid semi-solid slurry, said semi-solid slurry having a fraction solid comprising said particles sufficient to form a cast structure having a non-dendritic structure across substantially its entire cross section.

4,482,013

MECHANICAL WIRELINE BOREHOLE PACKER

Larry R. Fulkerson, Sandy, Utah, assignor to Norton Christensen, Inc., Salt Lake City, Utah

Filed May 23, 1983, Ser. No. 497,302
Int. Cl.³ E21B *33/12*
U.S. Cl. 166—118 **9 Claims**

1. A wireline supported mechanically operable packer device adapted for use in combination with and within a tubular drill string casing attached to a core drill bit having an internal shoulder and bore and raised to a site situated above a bottom of a bore hole for sealing off and testing the formation about a portion of the bore hole therebelow comprising:

an outer housing including

a central bore extending axially between axially spaced upper and lower stop surfaces,

a lower end chamber adjacent to and extending from the lower stop surface to a lower open end of the chamber and housing, and

a lower end portion and surface adapted for abutting engagement with the internal shoulder of the core drill bit about the lower open end of the housing;

an inner hollow mandrel slideably mounted in the central bore for limited axial movement between the axially spaced stop surfaces and to extended and contracted positions relative to the housing and having

a central internal passage extending axially from an upper entrance end connected to an inner bore of the casing to a lower exit end adjacent a lower open end of the housing;

resilient expandable packer seal means attached to, movable with and by the inner hollow mandrel having

an upper end portion attached to the lower end portion of the inner hollow mandrel and a lower open end portion extending from the upper end portion and normally drawn into, contracted and stored within the lower end chamber of the housing during axial movement of the mandrel to the extended position and ejected from the lower end chamber into sealing engagement with the bore hole wall during axial downward movement of the mandrel to the contracted position;

a resilient seal ring adapted to engage an upper surface of the housing surrounding a portion of the inner mandrel;

expander means about a portion of the inner mandrel for internal sealing engagement with, expanding and compressing the resilient seal ring into sealing engagement with the internal surface of the casing wall upon axial movement of the inner mandrel, expander means and packer seal means to the contracted sealing position; and

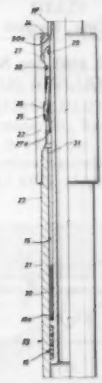
wireline means connected to the inner mandrel for lowering and retrieving the packer device within the drill string casing to and from sealing engagement with the bore hole wall.

4,482,014

BARRIER TOOL FOR POLISHED BORE RECEPTACLE

Roger P. Allwin, Midland, Tex., assignor to MWL Tool & Supply Company, Midland, Tex.

Filed Jul. 12, 1982, Ser. No. 397,680
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—136 **5 Claims**



1. In a well tool for use in a well bore where a liner hanger is set in a well bore and where the liner hanger includes a polished bore receptacle having a bore with a polished internal bore section for cooperation with a sliding seal assembly and where an annular latching groove is located in a bore of the polished bore receptacle proximately above the upper end of the internal bore section and at the upper end of the polished bore receptacle, the improvement comprising:

a tubular member adapted for coupling with a string of tubing, said tubular member having a sliding seal assembly means at its lower end for cooperating with the polished bore section in the polished bore receptacle on the liner hanger for providing a sliding and sealing interrelationship therebetween;

said tubular member having a reduced diameter above said seal assembly means defining an open annular space between the tubular member and the bore of the polished bore receptacle, and where said annular space extends

from the upper end of the polished bore receptacle to the seal assembly means;

means for releasably closing off the upper end of the polished bore receptacle above said seal assembly means relative to said tubular member yet permit a sliding relationship of said seal assembly means relative to the polished internal bore section comprising;

tubular cage means slidably disposed on said tubing member, said cage means having latching means adapted to releasably engage the annular latching groove in the upper end of the internal bore, means for resiliently actuating said latching means toward a position to engage the annular latching groove;

leaky seal means disposed on said cage means between said tubular member and said cage member and between said tubular member and the bore in the polished bore receptacle for closing off said open annular space yet permit a sliding relationship between said tubing member and said cage means when said latching means are in engagement with the annular latching groove thereby to prevent precipitation of materials in the well bore into the annular space;

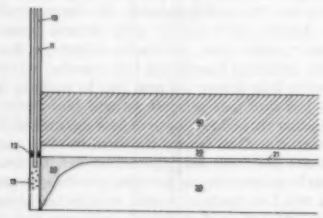
said tubular member having a downwardly facing flange for moving said cage member and latching means into latching engagement with the annular latching groove, said tubular member having an upwardly facing flange proximately located above said seal assembly means for engaging said cage means for release of said latching means from the annular latching groove.

4,482,015

SELECTIVELY PLUGGING SUBTERRANEAN FORMATIONS WITH A HYDROCARBON SOLUBLE FLUID

David O. Falk, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Apr. 14, 1983, Ser. No. 484,759
Int. Cl.³ E21B *43/12*
U.S. Cl. 166—288 **14 Claims**



1. A process for selectively plugging a highly permeable zone of a subterranean formation vertically bounded by a relatively less permeable zone comprising the steps of:

(a) dissolving a solid melamine in an aqueous formaldehyde solution to form a melamine/formaldehyde solution;

(b) combining said melamine/formaldehyde solution with a monohydric or polyhydric alcohol comprising at least about 6 carbon atoms to form a substantially hydrophobic emulsion wherein the moles of said formaldehyde exceed the moles of said melamine;

(c) injecting said emulsion into said highly permeable zone via a well in fluid communication with said highly permeable zone;

(d) displacing said emulsion along the interface between said highly permeable zone and said relatively less permeable zone; and

(e) reacting said emulsion in situ at the pressure of said subterranean formation, at a temperature of from about 80° C. to about 250° C. and for a time of from about 1 to about 4 days to produce a resin which is substantially impermeable to fluids and which substantially plugs said highly permeable zone.

4,482,016

ACIDIZING WITH CHEMICALLY HEATED WEAK ACID

Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 17, 1983, Ser. No. 552,938
Int. Cl.³ E21B *43/27, 43/22*
U.S. Cl. 166—300 **7 Claims**

1. A well treating process comprising:

flowing a self-reactive aqueous liquid solution into contact with materials in and around a well;

said solution consisting essentially of one which forms or contains a nitrogen gas generating mixture of (a) at least one water soluble compound which contains at least one nitrogen atom to which at least one hydrogen atom is attached and is capable of reacting within an aqueous medium to yield nitrogen gas and byproducts which are substantially inert to the components of the well and reservoir formation, (b) at least one oxidizing agent which is capable of reacting with said nitrogen containing compound to form said gas and byproducts and (c) at least one each of a water soluble weak acid and weak acid salt which are compatible with the nitrogen gas forming reactant;

said weak acid and weak acid salt being present in a ratio providing an acidic solution pH at which said nitrogen gas generating reactants react in response to the time-temperature exposure to which a solution is subjected while flowing from a surface location to the zone to be treated;

said nitrogen gas generating reactants being present in a concentration in which they are capable of generating a selected amount of heat and nitrogen during a reaction in response to said time-temperature exposure; and

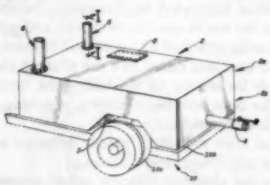
said mixture of weak acid and weak acid salt being present in a concentration providing an aqueous solution of weak acid which is capable of both maintaining said solution pH while the nitrogen gas generating reactants are reacting and, to a significant extent, effecting a weak acid reservoir acidization of materials contacted in and around the borehole of a well by providing a weak acid concentration in the injected solution of at least about five percent.

4,482,017

LIQUID SUPPLY TANK

Karl J. Morris, Alexis, Ill., assignor to Alexis Fire Equipment Co., Alexis, Ill.

Filed Mar. 9, 1982, Ser. No. 356,526
Int. Cl.³ A62C *27/20*
U.S. Cl. 169—24 **12 Claims**



1. In fire fighting apparatus including a liquid supply tank mounted on a mobile support, the liquid supply tank comprising:

a hollow liquid supply tank having an upper portion and a lower portion, said lower portion mounted on said mobile support;

fill neck means located on said upper tank portion and communicating with the interior thereof, said fill neck means including buoyant float valve means responsive to the liquid level within said tank for sealing said fill neck means when said tank is substantially filled with liquid and when

the liquid within said tank is in motion toward said fill neck means, and automatically unsealing said fill neck means when the liquid in said tank is withdrawn from said buoyant float valve means;

overflow relief means located on said upper tank portion and communicating with the interior thereof, said relief means adapted to open when the interior tank pressure exceeds a predetermined value;

drain means connected to said relief means to direct overflow tank liquid from said relief means to a predetermined location; and

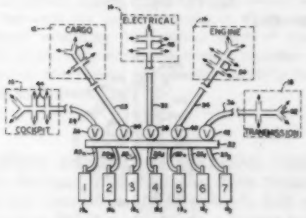
valve means located on said lower tank portion and communicating with the interior thereof for selectively emptying and filling said tank.

4,482,018

FIRE PROTECTION SYSTEM FOR AIRCRAFT

William A. Enk, 1213 Horizon, Blue Springs, Mo. 64015, and Ronald Migis, Jackson County, Mo., assignors to William A. Enk, Blue Springs, Mo.

Filed Nov. 25, 1981, Ser. No. 324,698
Int. Cl.³ A62C *35/12*
U.S. Cl. 169—62 **29 Claims**



1. A fire protection system for a vehicle such as on aircraft presenting therein a plurality of fire zones, said system comprising:

a plurality of closed containers each holding extinguishant;

a manifold connected with each container to receive extinguishant therefrom;

an extinguishant line for each fire zone, each line having one end communicating with said manifold and an opposite end communicating with the corresponding fire zone to apply extinguishant thereto;

a valve for each extinguishant line having an open position wherein the corresponding extinguishant line is open between said manifold and the corresponding fire zone and a closed position wherein the corresponding extinguishant line is closed;

means for discharging each container to apply the extinguishant therein to said manifold;

valve control means for each valve operable to move same from the closed position to the open position; and

means for inhibiting said discharging means to prevent any container from being opened unless at least one valve is in the open position, whereby at least one valve is open whenever extinguishant is discharged from any container to the manifold.

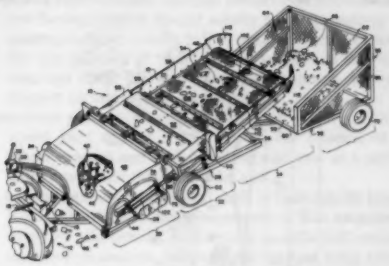
4,482,019

EARTH SURFACE CLEANING MACHINE

Donald G. Murphy, 14 Chippewa, Lake Barrington, Ill. 60010

Filed Jun. 28, 1982, Ser. No. 392,876
Int. Cl.³ A01D *17/00*
U.S. Cl. 171—63 **47 Claims**

1. An earth surface cleaning machine for cleaning the earth surfaces such as beaches, said machine including hitch means connectable to, adapted to be operated from, and pulled by a vehicle, such as a tractor, said machine comprising: a first wheeled carriage, skimming means conveyor transfer belt means, and conveying and screening means on said carriage, said skimming means comprising a plurality of spaced apart tines mounted on a shaft extending transversely of and journalled at the front end of said first carriage for skimming material from the earth surface as said machine is pulled over the earth surface by a vehicle, a hood over said tines, drive means for rotating said shaft in a direction so as to cause said tines to engage or skim the earth surface to engage and lift skimmed material forwardly of the direction of movement of said first



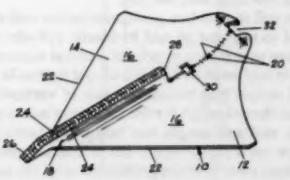
carriage adjacent and along the undersurface of said hood in an upward rearward movement to be deposited on said conveyor transfer belt means to be conveyed and deposited on said conveying and screening means for conveying and simultaneously screening the skimmed material from small earth particulate matter such as sand transferred thereto by said conveyor transfer belt means, and receptacle means for collecting the screened material delivered thereto by said conveying and screening means.

4,482,020

AGRICULTURAL SHARE FORMED IN TWO MIRROR IMAGE PARTS

H. Frank Jarvis, 21 Fermaner St., Karrinyup, Australia (6018)

Filed Mar. 9, 1983, Ser. No. 473,646
Claims priority, application Australia, Mar. 10, 1982, PF3049
Int. Cl.³ A01B *15/04, 39/22*
U.S. Cl. 172—726 **12 Claims**



1. An agricultural share formed in two parts wherein said parts are mirror images of one another and each part comprises a major face having a point, said face having a first, inner edge extending rearwardly from the point and a second, outer edge extending rearwardly from the point and diverging at an acute angle away from the first edge, an upstanding flange disposed at an angle greater than 90° to the major face, extending along at least part of the first edge and extending forwardly at least as far as the point, and a respective open faced aperture in said inner edge of each part, said parts being joined together along their inner edges with the flanges on the respective edges abutting each other and forming a ridge between the major faces, an appropriate joining means joining the flanges, the joining of the inner edges mating the open faced apertures to form a mounting aperture arranged to receive a mounting bolt,

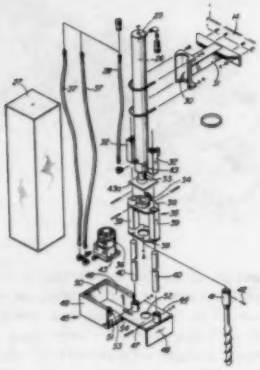
said mounting aperture being in alignment with the ridge formed by the joined flanges.

4,482,021

SOIL SAMPLER

Roman Repski, P.O. Box 930, Vegreville, Alberta, Canada (T0B 4L0)

Filed Sep. 7, 1982, Ser. No. 415,377
Int. Cl.³ E21B *49/02*
U.S. Cl. 175—209 **10 Claims**



1. A soil sample device comprising:

(a) an upper hydraulic cylinder provided with a casing and a rod movable from said casing, the casing thereof being anchored;

(b) a rotary motor fixedly mounted at the end of said rod of said hydraulic cylinder and adapted for vertical movement relative to said anchored casing of said hydraulic cylinder together with said rod of said hydraulic cylinder;

(c) an auger secured to, and rotatably driven by, said motor, said motor and auger being cooperatively vertically movable by said rod between an inoperative position, in which said auger is out of contact with the soil, and an operative position, in which said auger passes through, and a predetermined distance into, the soil;

(d) a lower soil sample box positioned below said motor and mounted to said rod of said hydraulic cylinder at a location above said rotary motor for vertical movement with respect to said anchored casing of said hydraulic cylinder, said soil sample box including a pair of vertically aligned apertures therethrough for the passage of said auger therethrough, said soil sample box being thus vertically movable between a rest position out of contact with the soil and an operative position positioned atop the soil; and

(e) guide means to guide said rotary motor and said auger, for said vertical movement.

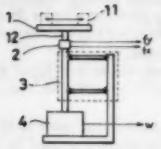
4,482,022

ELECTRONIC BALANCE WITH LOAD PLACEMENT DEVIATION CORRECTION

Akira Komoto, Otsu, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Dec. 29, 1981, Ser. No. 335,363
Claims priority, application Japan, Dec. 29, 1980, 55-185640
Int. Cl.³ G01G *23/22, 3/14, 21/24*
U.S. Cl. 177—25 **10 Claims**

1. An electronic balance comprising a pan for receiving a load to be weighed, a first means for measuring said load on said pan, said means being adapted to measure a load normally acting on said pan, a second means for detecting a possible deviation of the line of action of said load from the required point of placement on said pan, a third means for correcting an error in the measured value in accordance with a detected



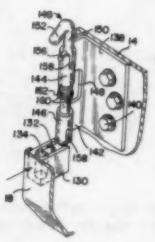
degree of deviation, and a fourth means for outputting said corrected value.

4,482,023

SELF-LOOKING PORTABLE PANEL

Leo M. Dziedzic, Downers Grove; Lloyd B. Idelman, Evanston, and Lawrence M. Sobol, Hinsdale, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed May 18, 1982, Ser. No. 379,430
Int. Cl.³ B62D *25/12*
U.S. Cl. 180—89.17 **7 Claims**



1. In a motor vehicle having a hood wall and a panel opening therein being coverable by a portable panel;

said panel releasably secured to said hood wall by at least one disconnectable hinge mechanism at a first end of said panel, and a second end thereof being able to swing about said mechanism;

said panel having an inner side facing the interior of said hood;

said hinge mechanism comprising one fixed part with aligning means to receive and coact with another mechanism part for facilitating the swinging movement of said panel about said fixed part;

said another mechanism part comprising a rotatable finger tab element being spring-loaded and guidable by said aligning means into a locking engagement with said fixed part; and

said hinge mechanism being self-lockable by said finger tab upon an impact thereof by said panel, thereby automatically coupling said panel to said hood wall.

4,482,024

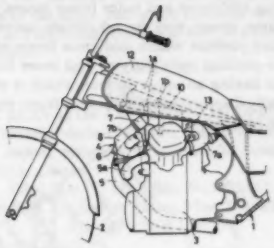
SUPERCHARGER APPARATUS FOR INTERNAL COMBUSTION ENGINE IN MOTORIZED TWO-WHEELED VEHICLE

Minoru Matsuda, Chofu; Takashi Shinozaki, Tokorozawa, and Kentaro Kato, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1981, Ser. No. 277,223
Claims priority, application Japan, Jun. 26, 1980, 55-85865
Int. Cl.³ F02D *23/00*
U.S. Cl. 180—219 **4 Claims**

1. A supercharger apparatus for an internal combustion

engine in a motorized two-wheeled vehicle, wherein an internal combustion engine is mounted on the middle portion of the vehicle body, and wherein the main frame of the vehicle body includes at least a right frame and a left frame extending forwardly and rearwardly above the engine, said supercharger apparatus comprising: an exhaust turbine provided in an exhaust passage of the engine; a compressor provided in an intake



passage of the engine and arranged to be driven by the turbine; and an expansion chamber operatively coupled in the intake passage between the outlet opening of the compressor and intake pipes extending from intake ports of the respective cylinders of the engine, said expansion chamber being positioned above the engine and at least partially between said right and left frames.

4,482,025

STEERED AND DRIVEN AXLE-END ASSEMBLY

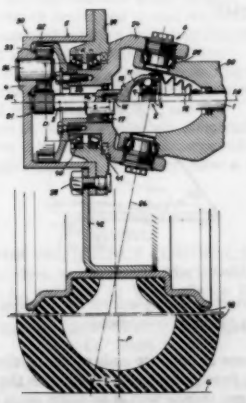
Friedrich Ehrlinger, Friedrichshafen; Peter Dziuba, Ueberlingen; Dieter Maurer, and Manfred Goeft, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Division of Ser. No. 172,280, Jul. 25, 1980, Pat. No. 4,418,785. This application Jul. 14, 1983, Ser. No. 499,384

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930298

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—255 **5 Claims**



1. A steered and driven axle-end assembly comprising:

an inside knuckle half;

an outside knuckle half pivotal on said inside half about an upright pivot axis;

an axle extending into said inside knuckle half;

a universal joint having an inner side toward the inside of said pivot axis and connected in said inside knuckle half to said axle and an outer side toward the outside of said pivot axis and constituted by a stub shaft formed unitarily with a drive pinion;

a wheel support rotatable about a horizontal wheel axis and lying mainly outside said pivot axis;

a wheel mounted on said support and having a periphery engageable with the ground and centered on a wheel plane perpendicular to said wheel axis, said pivot axis crossing said plane radially within said periphery;

a pair of tapered-roller bearings centered on said wheel axis and having centers spaced axially apart therealong by a spacing equal to at most half of the axial distance between the intersections of their contact angles and said wheel axis, said roller bearings rotatably supporting said wheel support on said outside knuckle half;

stepdown gearing connecting said drive pinion of said universal joint to said wheel support for rotation of said wheel support and said wheel by said axle at a substantially lower rate than said axle, and

a bearing supporting said stub shaft in said outside knuckle half, said stub shaft being supported in said knuckle half solely by said bearing, said outside knuckle half, universal joint, wheel support, bearings, and gearing lying substantially within the axial boundaries of the vertical projection of said wheel.

4,482,026

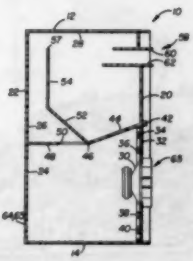
LOUDSPEAKER ENCLOSURE

George D. Stehlin, Jr., c/o Alexander Weilgart, 2337 Harrison St., Oakland, Calif. 94612

Filed Dec. 2, 1982, Ser. No. 446,422

Int. Cl.³ H05K *5/100*

U.S. Cl. 181—152 **16 Claims**



1. A loudspeaker enclosure comprising:

a first chamber adapted to mount a loudspeaker which first chamger has a front wall adapted to mount the loudspeaker, a plurality of side walls including first, second, third and fourth side walls and a back wall, each of said first, second, third and fourth side walls connected to said front wall and to said back wall to form said first chamber;

a second chamber located adjacent said first side wall of the first chamber;

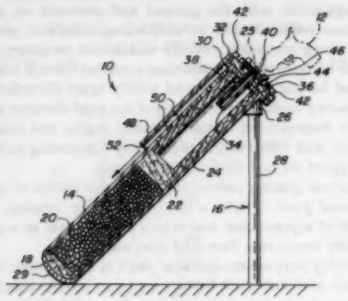
aperture means for communicating the first chamber with the second chamber, which aperture means is provided through said first side wall, substantially extending toward the back wall from a point substantially midway between the front and back walls, and not contacting the back wall or either of the second or fourth side walls.

4,482,027

ACOUSTIC TRAP FOR DISCHARGING FIRE ARMS

William A. Gould, 486 14th St., Brooklyn, N.Y. 11215

Filed Aug. 29, 1983, Ser. No. 527,570
Int. Cl.³ F41C *21/08*; F41F *17/12*
U.S. Cl. 181—223 **7 Claims**



1. An acoustic trap for discharging fire arms which comprises:

(a) an elongated sealed chamber;

(b) a support for placing said chamber in an angular downward position so that a barrel of the fire arm can discharge a bullet within said chamber;

(c) means for pulverizing the bullet within said chamber; and

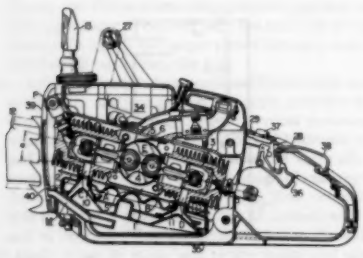
(d) means for reducing noise level within said chamber.

4,482,028

MUFFLER FOR INTERNAL COMBUSTION ENGINE

Takashi Fukuoka, Fuchu, and Yoshikiyo Kamata, Hachioji, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 458,808
Claims priority, application Japan, May 25, 1982, 57-75757[U]
Int. Cl.³ F01N *7/10*
U.S. Cl. 181—240 **1 Claim**



1. An exhaust muffler for internal combustion engine, connected at a plurality of points **10, 11** thereof to portions of said engine characterized by comprising a corrugation S for absorbing thermal expansion and contraction of said muffler provided in at least the part of said muffler between said points **10, 11** at which said muffler is connected to said engine.

4,482,029

TRUCK LADDER

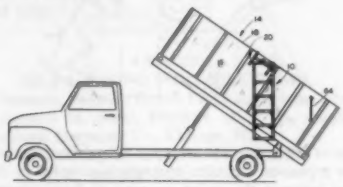
William J. Prochaska, Rt. 1, Box 161, Palmer, Nebr. 68864

Filed Jun. 23, 1983, Ser. No. 507,097
Int. Cl.³ E06C *5/24*
U.S. Cl. 182—96 **1 Claim**

1. In combination with a truck box having an upper edge, comprising,

a ladder comprising a bracket means including a pair of spaced-apart bracket members which engage the upper outer surface of said box, said bracket members having inverted generally V-shaped hooks at the upper ends thereof which receive and engage the upper edge of the box, and a brace secured to and extending between said bracket members,

said ladder also including an inner frame means, an outer frame means and step members operatively pivotally connecting said inner and outer frame means so that said outer frame means may be selectively moved from an inoperative position within said inner frame means, to an operative position outwardly of said inner frame means, said steps having an upper surface which is substantially horizontally disposed when said outer frame means is in its operative position,



said inner frame means being pivotally secured at its upper end to said brace whereby said ladder will remain vertically disposed regardless of the inclination of the truck box and wherein said ladder may be pivotally moved to a storage position when said ladder is not being used,

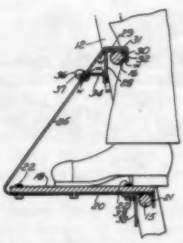
said inner frame means having a plurality of stops secured thereto which extend horizontally outwardly therefrom in the pivotal path of said steps to limit the movement of said outer frame means relative to said inner frame means to maintain said steps in a substantially horizontally disposed condition when said outer frame means is in its operative position.

4,482,030

SUPPORT PLATFORM

William R. Lincourt, 54 E. Bowery St., Newport, R.I. 02840

Filed Sep. 23, 1983, Ser. No. 535,046
Int. Cl.³ E06C *7/16, 7/08*
U.S. Cl. 182—121 **1 Claim**



1. An improved support platform for a ladder with side rails and a plurality of rungs comprising:

a platform;

a pair of straps at opposite ends of the platform, each strap extending from one edge thereof across the bottom of the platform and thence bent at an acute angle upwardly to a terminus;

first hook members formed from said straps and located at the upper terminus of the straps for engaging an upper rung of a ladder;

reinforcing and guiding members, each having portions in face engagement with the first hook members and having an elongated leg spaced inwardly from the extremity of

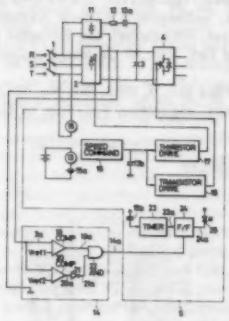
the hook member to guide the hook member on to a rung;
second hook members located at the lower terminus of the straps for engaging the lower rungs of the ladder;
second L-shaped members affixed inwardly from said second hook members and having elongated leg portions extended downwardly beyond the terminal end of the second hook members to engage the run and guide the second hook members onto a rung;
a spreader bar fastened between the upwardly extending portions of the straps below the terminus thereof, the bar serving as a stiffening member as well as a handle to move the platform.

4,482,031

AC ELEVATOR CONTROL APPARATUS

Masayuki Yoshida; Masami Nomura, and Hiroyuki Ikejima, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,461
Claims priority, application Japan, Mar. 9, 1982, 57-37064
Int. Cl.³ B66B *5/02*
U.S. Cl. 187—29 R **10 Claims**



1. In an AC elevator control apparatus wherein AC power supplied from an AC source is rectified by a converter and a smoothing capacitor into DC power, the DC power being in turn converted by an inverter into variable-frequency AC power by which an AC electric motor is driven to operate an operator cage, the improvement comprising:
a rectifying circuit connected to said AC source;
a resistor connected between an output side of said rectifying circuit and said smoothing capacitor;
charging time measuring means for measuring the time from turn-on of said AC source until the completion of charging of said smoothing capacitor; and
a control circuit for producing an abnormality detection signal when it is detected that an output of said charging time measuring means is shorter than a predetemined value.

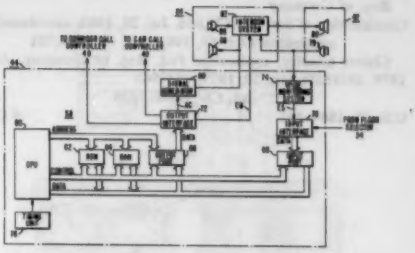
4,482,032

ELEVATOR EMERGENCY CONTROL SYSTEM

Emanuel E. Enriquez, and Robert C. MacDonald, both of West Caldwell, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1983, Ser. No. 488,340
Int. Cl.³ B66B *5/00*
U.S. Cl. 187—29 R **7 Claims**

1. An emergency control system for use in an elevator system including a structure having a plurality of floors, an elevator car mounted for movement relative to the structure to serve the floors, a traffic director's station, a plurality of hall call selecting means mounted on each one of the plurality of landings, and landing selecting means and emergency stop button means mounted in the elevator car, said emergency control system comprising:
first means for storing a code word known only to users of the elevator system;
second means in the elevator car for producing an emergency signal in response to a vocal signal from an elevator passenger experiencing an emergency situation;



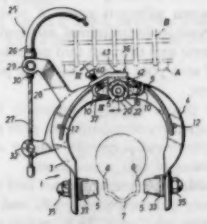
third means for comparing the code word in said memory means with said emergency signal and for producing a recognition signal when said emergency signal matches the code word;
and elevator control means for moving the elevator car to a predetermined one of the plurality of floors in response to said recognition signal.

4,482,033

CALIPER BRAKE APPARATUS OF THE SIDE-PULL TYPE

Toshiharu Yoshigai, Higashi-Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Kabushiki Kaisha, Osaka, Japan

Filed Sep. 3, 1981, Ser. No. 299,206
Int. Cl.³ B62L *3/00*; **F16D** *65/46*
U.S. Cl. 188—24.19 **4 Claims**



1. A caliper brake apparatus of the side-pull type for a bicycle including a center rod fixed to the frame of the bicycle, a first arm and a second arm mounted on the center rod and pivotally movable to bring their forward ends toward or away from each other, a brake shoe attached to the forward end of each of the arms and movable into or out of contact with the rim of a wheel of the bicycle when the arms are moved toward or away from each other, a brake spring provided along the arms and biasing the arms away from each other, and a center adjusting device provided between the center rod and the brake spring, the center adjusting device comprising a fixed member fixedly mounted on the center rod and a turnable member rotatably mounted on the center rod, the turnable member holding the brake spring and having a pair of projections extending diametrically outwardly of the rod, the fixed member being provided with a screw member having a forward end in contact with one of the projections of the turnable member for adjusting the turned position of the turnable member, the fixed member being provided with a spring member in bearing contact with the other projection of the turnable member for biasing the turnable member to hold said one projection

in contact with the forward end of the screw member at all times.

4,482,034

SWITCHABLE PERMANENT MAGNET BRAKE

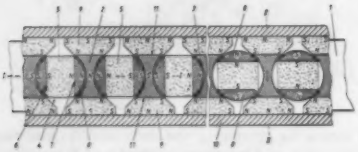
Max Baermann, Postfach 26, 5060 Bergisch Gladbach 1, Fed. Rep. of Germany

Continuation of Ser. No. 172,866, Jul. 28, 1980, abandoned. This application Oct. 18, 1982, Ser. No. 434,751

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931539; Sep. 20, 1979, 2937968

Int. Cl.³ B60L *7/28*

U.S. Cl. 188—165 **6 Claims**



1. A switchable permanent magnet brake with pole pieces of alternating magnetic polarity including:

(a) a plurality of pairs of elongated spaced stationary permanent magnets of low permeability with an abutting ferromagnetic pole piece between each pair, the magnets of each pair being magnetized on a transverse axis with the same magnetic polarity facing the intermediate pole piece, said pole piece having the same magnetic polarity as said facing magnetic polarity;

(b) said pairs of magnets and pole pieces being arranged in side by side spaced relationship with alternating magnetic polarity and with flux return members between adjacent pairs;

(c) an elongated permanent magnet of low permeability having a pair of abutting ferromagnetic pole shoes positioned between adjacent pairs of said pole pieces and rotatable about its longitudinal axis and each magnetized on a transverse axis through said pole shoes, the longitudinal ends of said pole pieces and said pole shoes forming pole surfaces;

(d) said pole pieces having oppositely facing cylindrical segment-shaped recesses and said pole shoes being in the shape of cylindrical segments mating with the segment-shaped recesses of said pole pieces;

(e) said rotatable permanent magnet and its pole shoes and the stationary permanent magnets and their pole pieces forming in one position of the rotatable permanent magnet a closed multisided cross-section of ferromagnetic material surrounded on all sides by permanent magnet material of the same magnetic polarity whereby each magnet has a ferromagnetic member in abutting relationship therewith for conducting flux axially to the pole face of said brake with a minimum reluctance.

4,482,035

SHOCK ABSORBER

Robert Heideman, 34316 Barton, Westland, Mich. 48185, and Richard G. Dressell, Jr., 14609 Stonehouse, Livonia, Mich. 48154

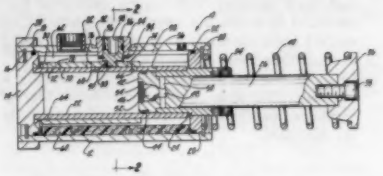
Filed Sep. 23, 1982, Ser. No. 422,044

Int. Cl.³ F16F *9/48*; F15D *1/06*; F16K *31/524*

U.S. Cl. 188—287 **10 Claims**

1. In a shock absorbing device for absorbing kinetic energy of a moving member so as to decelerate the member, said device including a tubular cylinder with a plurality of spaced holes formed in its wall, a metering tube in the form of a sleeve with a number of holes equal to the number of cylinder holes extending through its wall, and a piston slidable with the cylinder adapted to be contacted by the moving member, the improvement comprising:

means for creating simultaneous relative radial and axial



movement between said sleeve and said cylinder so that the holes therein move relative to one another in an orbital pattern whereby the size of a metering orifice defined by the holes may be adjusted.

4,482,036

HYDROPNEUMATIC DAMPING DEVICE

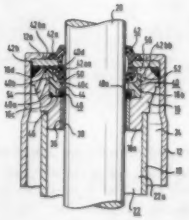
Felix Wössner, Schweinfurt; Ludwig Axthammer, Hambach; Günther Heyer, Schweinfurt, and Hermann Itzinger, Dittelbrunn, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG

Filed Feb. 9, 1983, Ser. No. 465,047

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206124

Int. Cl.³ F16F *9/348*

U.S. Cl. 188—322.13 **16 Claims**



1. In a hydropneumatic damping device comprising

(a) an inner cylinder (**10**) having an axis and two ends, namely a first end and a second end,

(b) a central cavity (**22**) defined within said inner cylinder (**10**) between said two ends,

(c) an outer container (**12**) surrounding said inner cylinder (**10**), said outer container (**12**) having first and second ends adjacent said first and second ends of said inner cylinder (**10**), respectively,

(d) an annular cavity (**24**) defined between said inner cylinder (**10**) and said outer container (**12**),

(e) first and second closure means (**16**, **14**) closing said first and second ends of said cylinder (**10**) and said container (**12**), respectively,

(f) piston rod passage means through the first ones (**16**) of said closure means,

(g) fluid passage means (**32**) between said central cavity (**22**) and said annular cavity (**24**) adjacent the second ones (**14**) of said closure means,

(h) first fluid throttling means (**34**) associated to said fluid passage means (**32**),

(i) a piston rod (**20**) axially extending through said piston rod passage means and into said central cavity (**22**),

(k) a piston unit (**26**) mounted on said piston rod (**20**) within said central cavity (**22**) and defining two working chambers (**22*a*, 22*b***) within said cavity (**22**), a first working chamber (**22*a***) adjacent said first closure means (**16**) and a

second working chamber (22*b*) adjacent said second closure means (14),

(l) fluid connecting means (28) connecting said two working chambers (22*a*, 22*b*) across said piston unit (26),

(m) second fluid throttling means (30) associated to said fluid connecting means (28),

(n) a body of liquid at least within the central one (22) of said cavities,

(o) a body of gas within said annular cavity (24), said first closure means comprising

(aa) a cavity-closing unit (16) surrounding said piston rod (20) and having an axially inner end (16*a*) adjacent said first working chamber (22*a*) and an axially outer end,

(bb) securing means (12*a*) provided on said container (12) adjacent the first end thereof for axially securing said cavity-closing unit (16) with respect to said first end of said cylinder (10),

(cc) a sealing unit (42) engaging said piston rod (20) and having an outer side exposed to atmosphere and an inner side adjacent said cavities (22, 24) and axially outward of the axially inner end (16*a*) of said cavity-closing unit (16),

(dd) venting passage means (38, 46, 44, 50, 56, 52, 54) between said first working chamber (22*a*) and said annular cavity (24) extending across said cavity-closing unit (16) on the inner side of said sealing unit (42),

(ee) check valve means (16*c*, 48, 40*c*) associated to said venting passage means (38, 46, 44, 50, 56, 52, 54) permitting gas residues to flow from said first working chamber (22*a*) towards said annular cavity (24) and preventing reverse flow, said check valve means (16*c*, 48, 40*c*) comprising an annular check valve member (48) in frictional sliding engagement with said piston rod (20) for axial movement with said piston rod (20) towards a sealing position during inward movement of said piston rod (20) and towards an opening position during outward movement of said piston rod (20), first (16*c*) and second (40*c*) abutment means being provided for defining said sealing position and said opening position of said annular check valve member (48), respectively,

the improvement comprising: at least said second abutment means (40*c*) being axially secured with respect to said cavity-closing unit (16) by supporting means separate from said cavity-closing unit (16) and fixed with respect to said outer container.

4,482,037

LUBRICATING CONTROL SYSTEM FOR CLUTCHES

Achim Link, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG

Filed Jul. 12, 1982, Ser. No. 397,139

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127875

Int. Cl.³ F16D *13/74*; B60K *41/22*

U.S. Cl. 192—3.58 **3 Claims**

1. A clutch system for a motor vehicle including an engine and a manually shiftable transmission comprising:

a friction disc clutch including at least one clutch disc;

a releasing mechanism movable relative to said friction disc clutch for engagement and disengagement of said friction disc clutch;

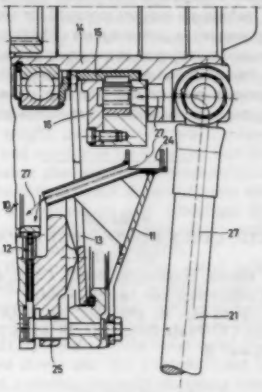
an oil reservoir for containing an oil supply;

an oil pump held in said releasing mechanism and connected by means of a flexible hose with said oil reservoir;

a control valve held at said releasing mechanism and controllably connecting said oil pump with an oil outlet opening provided at said release mechanism;

an oil collecting trough held at said friction disc clutch, said oil collecting trough feeding oil which emerges from said oil outlet to said friction disc clutch for cooling said clutch disc; and

a control mechanism for controlling said control valve, said control mechanism having two electrical control contacts of which a first of said control contacts is adapted to be activated in dependence upon the position of said release mechanism for generating a control pulse during disengagement of said clutch and for switching said control valve into a position in which it blocks said oil outlet opening, and a second control contact which in dependence on the gear position of said transmission operates to produce a control pulse when said transmission is shifted into transmitting engagement, said pulse operating to switch said control valve into the position in which the oil outlet is released.



4,482,038

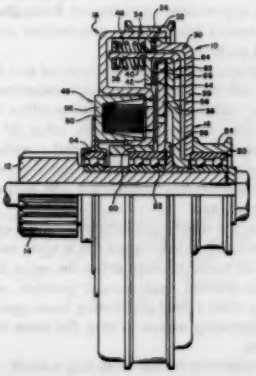
DOUBLE ACTIVE DRIVE MECHANISM

Murray R. Mason, Kent Bridge, Canada, assignor to Canadian Fram Limited, Canada

Filed Apr. 22, 1982, Ser. No. 370,768

Int. Cl.³ F16D *27/08*, *21/06*, *27/10*

U.S. Cl. 192—48.2 **5 Claims**



1. Double acting drive mechanism comprising:

a rotatable driving member, a pair of rotatable driven members coaxial with said driving member, and clutch means selectively shiftable from a first condition for coupling one of said driven members to said driving member to a second condition, coupling the other driven member to the driving member, said clutch means including first axially movable means mounted for rotation with said driving member, resilient means yieldably urging the first

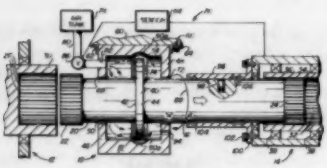
axially movable means into frictional engagement with said one driven member, second axially movable means mounted for rotation with the other member, and selectively actuatable means for moving said second axially movable means into engagement with the first axially movable means wherein, said one driven members includes an engagement face, said first axially movable means including a support mounted for rotation with said driving member, a pressure plate slidably mounted on said support and carrying an engagement surface, said resilient means being carried by said support and acting against said pressure plate to urge the engagement surface into driving engagement with said engagement face.

4,482,039

PNEUMATIC QUICK DISCONNECT APPARATUS AND METHODS

Edward N. Harris, Huntington Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 16, 1981, Ser. No. 302,879
Int. Cl.³ F16D *25/061, 43/28;* F15B *15/22*
U.S. Cl. 192—67 R **10 Claims**



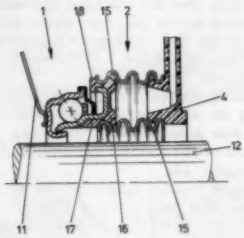
1. An accessory drive system comprising:
(a) a driving mechanism;
(b) a drivable accessory; and
(c) disconnect means for connecting and transmitting mechanical power between said driving mechanism and said accessory, said disconnect means being operable, without imposing appreciable rigid impact force thereon, to rapidly disconnect said driving mechanism and said accessory, and including:
(1) connecting means carried by one of said driving mechanism and said accessory for translational movement relative thereto between a first position in which said connecting means engage the other of said driving mechanism and said accessory and couples said driving mechanism and said accessory, and a second position in which said driving mechanism and said accessory are uncoupled, and
(2) means for utilizing a single quantity of compressed fluid to exert a fluid thrust force upon said connecting means to translationally drive the same from said first position toward said second position and to subsequently exert a fluid cushioning force upon the translating connecting means to stop the same in said second position,
said connecting means including a shaft, and said fluid force exerting means including a housing enveloping a portion of said shaft and means for selectively injecting a burst of pressurized fluid into said housing,
said fluid force exerting means further including cooperating means on said shaft and said housing for causing the injected fluid to exert both of said forces on said connecting means without creating frictional forces between said housing and any portion of said shaft during movement of said shaft between said first and second positions.

4,482,040

HYDRAULIC RELEASE ARRANGEMENT FOR VEHICLE CLUTCHES

Manfred Brandenstein, Eussenheim, and Rüdiger Hans, Niederwerrn, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 402,832
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130514
Int. Cl.³ F16D *23/14, 25/08*
U.S. Cl. 192—88 A **12 Claims**



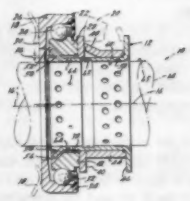
1. In an hydraulic release arrangement for vehicle clutches or the like comprised of an annular cylinder arranged around a drive shaft or the like and acting axially on a release bearing said annular cylinder having first and second circumferential walls, the first circumferential wall of the annular cylinder comprising a first axially expandable spring metal bellows; the improvement wherein the second circumferential wall is comprised of a second spring metal bellows, and the release bearing is connected firmly to both the spring metal bellows and is axially guided by said first and second bellows and solely radially and circumferentially guided by said first and second bellows.

4,482,041

SELF-ALIGNING CLUTCH RELEASE BEARING ASSEMBLY WITH LUBRICATION RESERVOIR

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Dec. 14, 1981, Ser. No. 330,130
Int. Cl.³ F16D *13/74, 23/14*
U.S. Cl. 192—98 **5 Claims**



1. An improved self-aligning clutch release bearing assembly for a friction clutch in a vehicle power train having release lever means rotatable about an input shaft axis of said clutch, a

guide member disposed generally coaxially around a transmission shaft axis of said power train and actuating means, comprising:

a tubular bearing carrier slidably mounted on said guide member for reciprocable, translational movement therealong in response to actuation of said actuating means, said tubular member having a plurality of generally radial passageways extending therethrough intermediate the ends thereof;

a bearing including a plurality of anti-friction elements interposed between radially spaced inner and outer race members, one of said race members being adapted for rotation and having an annular radially extending bearing surface for engaging said clutch release lever means;

said bearing being radially moveably supported on said bearing carrier in overlying relationship to said passageways and axially located between said release lever means and said actuating means;

said bearing being formed to provide a predetermined radial clearance between said bearing and an axially extending surface of said bearing carrier for permitting said bearing to shift radially with respect to said bearing carrier, so that said bearing may coaxially align itself with said clutch input axis; and

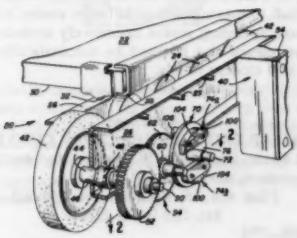
a lubrication reservoir defined in part by said predetermined radial clearance, and having a lubricant contained therein, said radial shifting of said bearing being operative to transfer lubricant through said passageways to said guide member.

4,482,042

RETARDER DEVICE FOR MOVING OBJECTS

Thomas J. Siska, Norridge, Ill., and James H. Obermeyer, Crown Point, Ind., assignors to UNR Industries, Inc., Chicago, Ill.

Filed May 17, 1982, Ser. No. 378,865
Int. Cl.³ B65G *13/075*
U.S. Cl. 193—35 A **26 Claims**



1. A retarder device for gradual, two-stage application of braking force to a moving object as it follows a predetermined path, which comprises:

(a) support means for mounting said device in a fixed position adjacent said predetermined path;

(b) a gear train mounted in said support means, said gear train comprising a plurality of rotatably mounted gears, including at least a first gear and a terminal gear, intermeshed so as to progressively increase the angular velocity of the rotating gears as the first gear in the train is rotated;

(c) means, including a rotatably mounted brake wheel positioned to be contacted by said moving object, for translating linear movement of said object along said predetermined path into rotational movement of said first gear;

(d) a fly wheel rotatably mounted in said support means and fixedly secured to said terminal gear;

(e) at least two fly weights pivotally attached to said fly wheel on one side thereof, each of said fly weights being normally resiliently biased in a retracted position in which a portion of said weight, and only said portion, extends outward normal to said one side of the fly wheel a first predetermined distance; and

(f) a friction member having a substantially planar surface, said member being mounted on said support means substantially parallel to said one side of the fly wheel and, when said fly wheel and fly weights are at rest, spaced from said fly weights a second predetermined distance measured normal to said one side of the fly wheel,

each of said fly weights pivoting, in response to centrifugal forces generated by rotation of said fly wheel and said fly weights with an angular velocity greater than a first predetermined angular velocity when the linear speed of said moving object rises above a first predetermined linear speed, to move to an extended position in which a portion of said fly weight, and only said portion, extends outward normal to said one side of the fly wheel said first predetermined distance plus said second predetermined distance, said portion of each of said fly weights that moves as thus described in response to said centrifugal forces being pressed against said substantially planar surface of said friction member by said movement,

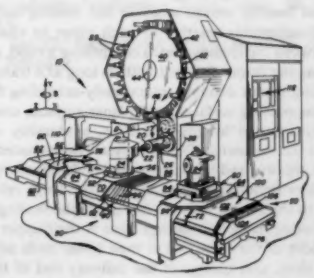
whereby (1) the inertia of said brake wheel, said gear train, said fly wheel, and said fly weights causes said brake wheel to apply to said moving object a first braking force when the object first comes into contact with said brake wheel, and (2) thereafter, if the linear speed of said moving object rises above said first predetermined linear speed and higher, a second, gradually increasing braking force is applied to said object as said fly weights pivot into frictional contact with said friction member in response to centrifugal forces generated by the rotation of said fly wheel and said fly weights at a gradually increasing angular velocity greater than said first predetermined angular velocity.

4,482,043

PALLET CHANGING SYSTEM FOR A MACHINING CENTER

Spencer S. Bauman, Rockford, and Dean L. Edwards, Belvidere, both of Ill., assignors to White-Sundstrand Machine Tool Co., Belvidere, Ill.

Filed Aug. 4, 1981, Ser. No. 290,102
Int. Cl.³ B27B *25/00*
U.S. Cl. 198—339 **25 Claims**



1. A pallet changer for a machine tool comprising:

a base;

a track mounted on said base;

a first pallet capable of being shuttled over said track between a standby position at a first end of said track and a central work position;

a second pallet capable of being shuttled over said track between said central work position and a standby position at a second end of said track;

a set of telescoping cover members lined along said track and secured between said first and second pallets;

an indexing saddle;

means for coupling said saddle to either of said pallets, including

means for locking a coupled pallet against rotation with respect to said saddle,

means for disengaging said locking means, and

means for rotating said coupled pallet with respect to said saddle when said locking means is disengaged; and

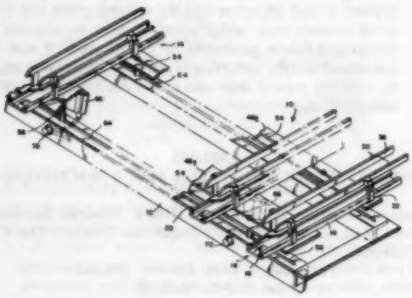
means for driving said saddle along said track to either shuttle a coupled pallet or to move said saddle between said pallets and beneath said telescoping cover members.

4,482,044

APPARATUS FOR SEPARATING NESTED COILS

Howard E. Redman, Brewster, and Roger O. Snowman, Weymouth, both of Mass., assignors to Mathewson Corporation, Quincy, Mass.

Filed May 3, 1982, Ser. No. 374,001
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—388 **5 Claims**



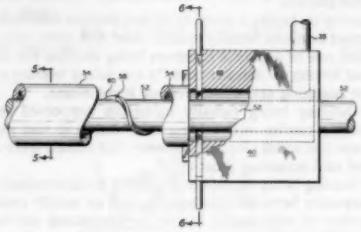
1. Apparatus for supplying coils to a plurality of spaced, parallel coil feeding means wherein the feeding means are transversely-adjustable relative to each other to change the spacing between the feeding means comprising a rigid, substantially rectangular frame disposed with its long axis transversely of the feeding means defining transversely-extending fore and aft planar supporting surfaces, said planar surfaces containing transversely-disposed longitudinal slots, a plurality of trays mounted to the support surfaces in transversely-spaced, parallel relation, means fixed to the trays and slidably interengaged with the slots permitting movement of the trays relative to each other to align them with the spacing of the feeding means, said means comprising coil springs fixed at their upper ends to the undersides of the trays and at their lower ends adjustable along said slots, said springs at the delivery end of the trays being shorter than those at the receiving ends of the trays such that the trays slope downwardly from the receiving ends toward the delivery ends, means for vibrating the trays said trays each comprising an elongate channel member of generally rectangular cross section having a planar bottom surface, spaced, parallel, upstanding sides and inwardly and upwardly-inclined flanges and each tray having at its receiving end an abutment rising from its planar bottom surface, wherein one of said flanges embodies coil turning means which, by intercepting the knots at the lower ends of the coils, turns the coils about their vertical axes so that the attitude of all of the coils is the same.

4,482,045

VALVE AND MATERIAL SUPPLY SYSTEM

Raymond G. Voss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 24, 1981, Ser. No. 324,366
Int. Cl.³ B65G *33/14*
U.S. Cl. 198—670 **22 Claims**



11. A material transport system for transporting a bulk material, comprising:

(a) a conduit adapted to pass said bulk material from a source of supply to a utilization means;

(b) a rotatable shaft passing through at least a portion of said conduit and having an outside diameter smaller than the inside diameter of said conduit to form an annular material transport space between said shaft and said conduit;

(c) worm-type transport means formed on the outside of said shaft, extending to the interior surface of said conduit and adapted to transport said bulk material from the upstream end of said annular material transport space to the downstream end of said material transport space;

(d) closure means mounted on said shaft adjacent said upstream end of said worm-type transport means and adapted to open and close said annular material transport space between said shaft and said conduit while permitting said shaft to rotate when said closure means is closed; and

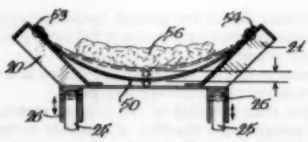
(e) closure operating means operatively connected to said closure means and adapted to automatically open and close said closure means.

4,482,046

FLEXIBLE TROUGH VIBRATORY CONVEYOR

Richard B. Kraus, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Apr. 15, 1982, Ser. No. 368,503
Int. Cl.³ B65G *27/00*
U.S. Cl. 198—771 **3 Claims**



1. A vibratory conveyor for conveying material comprising a base, an elongated conveyor having a conveyor frame along which material can travel from a loading end to a discharge end, means for vibrating the conveyor frame to advance material toward said discharge end including means limiting the conveyor frame for movement in a path inclined to the base and means defining a spring reactor system connected between the conveyor frame and the base, said conveyor frame having elongate spaced-apart side members extending lengthwise of the conveyor frame, each side member having edge portions lying parallel to the edge portions of the other side member, said side members extending outwardly and inclined upwardly

from said conveyor frame, and an elongate material-conveying flexible member extending substantially horizontally from the loading end to the discharge end of the conveyor, said flexible member being positioned between said side members and having outer edge portions tangent to and secured to the more remote outward portions of the side members with a major part thereof between said outer edge portions hanging downwardly from side to side in a catenary curve and being free to flex and to change its static shape as the conveyor frame is vibrated, said means for vibrating the conveyor frame and the flexible member acting on material on said flexible member to thrust the material upward and forward in movements along the flexible member to loosen the adhesion bond between the flexible member and the material, said material accumulating at the center of the flexible member and deflecting the center of the flexible member downward to increase the slope between the sides and thereby increase the frictional engagement with the material to increase the conveying action of the conveyor.

4,482,047

CONTAINER

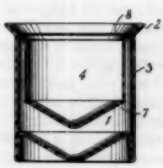
Horst W. Ackermann, Orbe, Switzerland, and Jean-Pierre Guays, Reading, Great Britain, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 31, 1983, Ser. No. 499,461

Claims priority, application Switzerland, Jun. 4, 1982, 3459/82

Int. Cl.[3] **B65D** *81/32, 85/72, 85/78;* **A21D** *10/02*

U.S. Cl. 206—219 **6 Claims**



1. A container, comprising an outer container and an inner container, said inner container being less deep than said outer container and being suspended in said outer container by flexible suspension means, a passage being provided between the side walls of said inner and said outer container, the bottom of said inner container and the bottom of said outer container being of similar shape.

4,482,048

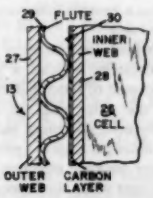
CONTAINER FOR STATIC-SENSITIVE ARTICLES

Norman S. Blodgett, Westboro, Mass., assignor to James M. Brown, Cohasset, Mass.

Filed Oct. 19, 1983, Ser. No. 543,301

Int. Cl.[3] **B65D** *73/02*

U.S. Cl. 206—328 **4 Claims**



1. Container for use with an article which can be damaged by static electricity, comprising:

(a) a plurality of walls forming a cell in which the article resides, each wall consisting of a sheet of corrugated board made up of an outer web located outside the cell, an inner web located inside the cell, and a corrugated flute sandwiched between the inner and outer webs, and

(b) a carbon layer carried on the surface of the inner web that faces away from the cell and is attached to the flute.

4,482,049

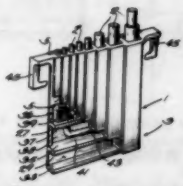
MAGNETIC DRILL HOLDER

Norbert J. Kot, II, 3278 N. Shepard Ave., Milwaukee, Wis. 53211

Filed Jan. 4, 1984, Ser. No. 568,046

Int. Cl.[3] **B65D** *85/24, 85/62*

U.S. Cl. 206—379 **7 Claims**



1. A magnetic tool holder for holding and storing a plurality of magnetic tools comprising:

(a) a housing having a plurality of adjoining generally U-shaped longitudinal channels, each channel being defined by a pair of spaced side walls, a top wall, and a transverse end wall; and

(b) a magnetic back plate attached to the housing to longitudinally enclose the channels to create a plurality of open ended elongated receptacles,

so that magnetic tools inserted into the receptacles are retained in place by the common magnetic back plate.

4,482,050

FILM CASSETTE

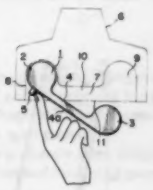
Atsushi Kidawara, and Kazunari Kobayashi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 524,124

Claims priority, application Japan, Aug. 24, 1982, 57-127703[U]

Int. Cl.[3] **B65D** *85/67, 85/671;* **B65H** *75/28*

U.S. Cl. 206—389 **6 Claims**



1. A film cassette comprising:

a first cylindrical body forming a film supply section;

a second cylindrical body forming a film take-up section; and

a coupling section extending between the first and second cylindrical bodies and connected at both ends to the two cylindrical bodies, thereby coupling the cylindrical bodies;

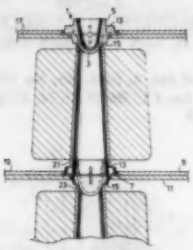
at least one of the cylindrical bodies having a catch portion formed on the outer peripheral surface thereof, to which is applied an urging force to rock the film cassette around that cylindrical body with the catch portion thereon.

4,482,051

SHIPPING PALLET

Bryant W. Cantey, Jr., 2111 Cleveland St., Greenville, S.C. 29607

Filed May 26, 1982, Ser. No. 382,151
Int. Cl.³ B65D *71/00*
U.S. Cl. 206—392 **2 Claims**



1. A pallet for use in shipping a plurality of similarly shapped articles, comprising:

a plurality of elongated article support members each comprising,

a centrally outwardly extending flange;

an article locator at each end of said support member; and

a ledge area extending laterally from said flange and being of less diameter than said flange and of greater diameter than said article locator;

at least two layers of crushable rigid material for entrapping said flange area of said article support member therebetween, said flange area thus being between upper and lower planar surfaces of said rigid material;

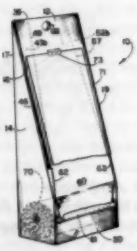
and wherein said ledge member extends beyond the planar surface of at least one surface of said rigid material for support of an article thereon and to prevent said article from contacting and crushing said rigid material and wherein said article locator lies within the perimeter of said ledge area.

4,482,052

WEDGE-SHAPED STRIP DISPLAY CARTON

Henry Wischusen, III, Lilburn, Ga., assignor to Rock-Tenn Company, Norcross, Ga.

Filed May 4, 1983, Ser. No. 491,556
Int. Cl.³ B65D *85/67, 85/671, 75/58*
U.S. Cl. 206—409 **9 Claims**



1. A wedge-shaped carton of paperboard or the like formed from a generally rectangular blank, comprising:

front and back wall panels held in spaced apart relation by a pair of side wall panels foldably connected along score lines to said front and back wall panels;

bottom panel means for enclosing one end of said carton;

each of said side wall panels including first and second diagonal score lines defining first and second diagonal fold lines extending from a common point along the score line connecting said side wall panel to said front wall panel, said first diagonal fold line extending upwardly to form a triangular gusset panel between said first diagonal fold line and said score line connecting said side wall panel to said front wall panel, and said second diagonal fold line dividing said triangular gusset panel;

said front wall panel including a bridging panel connecting said side wall panels to said bottom panel means, and a tongue panel extending downwardly to below said common point, said tongue panel being separated on three sides from the material of said carton below said common point; and

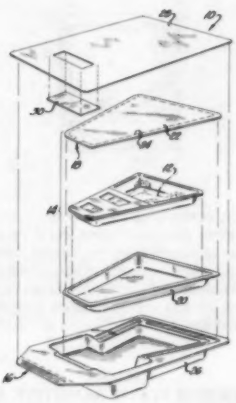
means for retaining said carton in a wedge-shaped configuration such that said triangular gusset panels fold inwardly into the interior of said carton and said tongue panel projects outwardly beyond the plane of said bridging panel.

4,482,053

SEALABLE CONTAINER FOR PACKAGING MEDICAL ARTICLES IN STERILE CONDITION

Marvin Alpern, and Thomas F. Genova, both of Edison, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 16, 1983, Ser. No. 552,511
Int. Cl.³ A61B *17/06, 19/02*
U.S. Cl. 206—439 **6 Claims**



1. A package for encasing a sterile medical product, which comprises:

(a) a sealable inner package formed of impervious sheet material, said inner package being arranged and constructed to contain said medical product, wherein the inner package has a heat sealable vent at a predetermined location thereon; and

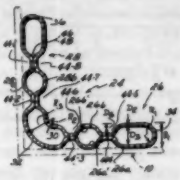
(b) a sealable outer package formed of sheet material that is impervious to bacteria, at least a portion of the outer package being formed of sheet material that is pervious to sterilizing gas, the outer package being arranged and constructed to receive said inner package therein and to snugly hold the inner package in a predetermined position, wherein the outer package contains means positioned to be adjacent said vent when the inner package is contained in the outer package in said predetermined position, said means being capable of transmitting sufficient heat therethrough to heat seal said vent without said means itself being heat sealed to said inner package.

4,482,054

SUPPORT AND CUSHIONING TUBE

Roland C. Gardner, Doylestown, Pa., assignor to Clevepost, Inc., Cincinnati, Ohio

Filed Apr. 22, 1982, Ser. No. 370,793
Int. Cl.³ B65D 81/02
U.S. Cl. 206—594 6 Claims



5. A corner post adapted to be snugly sandwiched in a clearance space between nested vertical corner edges of a rectangular container sleeve and a rectangular product located within the sleeve and adapted to be positioned between a container top cover and a container bottom, said corner post comprising:

a unitary one-piece convolutely wound paper tube having its surface treated with a hardenable material and its fibers disposed longitudinally, said tube having an unsealed and unpressurized interior and including a generally flattened section formed to provide a substantially right angular cross-section defined by generally planar spaced-apart, substantially parallel outer and inner walls shaped at substantially right angles along vertical outer and inner corners, respectively, to engage the associated inner vertical corner edge of said sleeve and the associated external vertical corner edge of a product, respectively, said tube having a first plurality of longitudinally-directed indentations along the length of at least one of said inner and outer walls on each side of its respectively associated corner, said plural indentations in said one wall extending substantially across said flattened tube section to said other wall, but being structurally unconnected relative thereto throughout a substantial portion of their length, for dividing said flattened tube section into at least three longitudinally-directed tubular subsections, said three tubular subsections including (a) a central tubular subsection located between said inner and outer vertical corners to provide a protective buffer for the vertical corner edge of a product located in said container sleeve and (b) a pair of outer tubular subsections disposed on opposite sides of said central subsection defined by spaced-apart outer and inner wall sections, said identations separating said central subsection from said outer subsections and having inner surfaces proximate said other wall opposite thereto for contacting the inner surface of said other wall when said corner post begins to buckle under compressive longitudinally-directed forces and/or transversely-directed forces applied thereto, each said tubular subsection being closed in horizontal cross-section throughout substantially its entire cross-section.

4,482,055

INTEGRAL CARTON BLANK FOR A CARTON WITH FOUR CELLS AND CARTON

Daniel J. Boyle, Hartland, Wis., assignor to Champion International Corporation, Stamford, Conn.

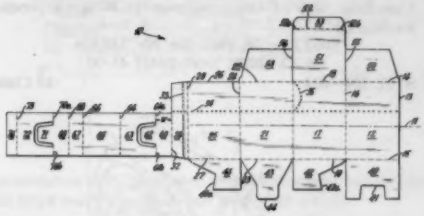
Continuation of Ser. No. 196,842, Oct. 14, 1980, abandoned.
This application Feb. 4, 1982, Ser. No. 345,610
Int. Cl.³ B65D 5/48, 5/54
U.S. Cl. 206—606 9 Claims

1. A one-piece paperboard carton blank adapted to be erected into a carton, the carton having integral internal dividing means forming a multi-cell carton, said carton blank comprising:

a series of four side panels connected by fold lines, aligned in tandem along a common axis and adapted to form the four side walls of the carton;

a plurality of bottom flaps, each bottom flap being connected by a fold line to one of said side panels, said bottom flaps being adapted to form the bottom of the carton; and

a plurality of cell panels adapted to form the dividing means of the carton, said cell panels being connected in tandem by fold lines along said axis, said cell panels comprising a



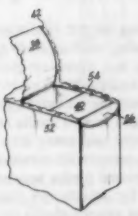
first cell panel having an extending tongue portion; a second cell panel having an indentation in which the tongue portion of the first panel is located; a third cell panel; a fourth cell panel having glue means thereon; a fifth cell panel having an extending tongue portion; a sixth cell panel having an indentation in which the tongue portion of the fifth cell panel is located; and a seventh cell panel having glue means thereon.

4,482,056

CARTON WITH RECESSED OPENER

Daniel P. Dutcher, Blaine, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed May 18, 1983, Ser. No. 495,599
Int. Cl.³ B65D 5/54
U.S. Cl. 206—611 1 Claim



1. A tear open paperboard carton comprising:

(a) a front wall panel and an opposed back wall panel;

(b) opposed side wall panels foldably connected to edges of said front and back wall panels;

(c) first and second top closure flaps foldably connected to top edges of said front and back wall panels along first and second fold lines;

(d) a recess panel foldably connected to one of said side wall panels along a curvilinear fold line with the ends of said curvilinear fold line being contiguous to ends of said first and second fold lines;

(e) a rectilinear fold line defining an inner boundary of said recess panel, said rectilinear fold line extending to the edges of said recess panel with the ends of said rectilinear fold line being inwardly offset from the ends of said curvilinear fold line;

(f) a third top closure flap foldably connected to said recess panel along said rectilinear fold line;

(g) said recess panel and said third top closure flap underlying said first and second top closure flaps when the latter

are folded into overlapping relationship to form a top closure for the carton; and

(h) means forming parallel lines of rupture on said first and second top closure flaps whereby the latter can be torn off of the carton.

4,482,057

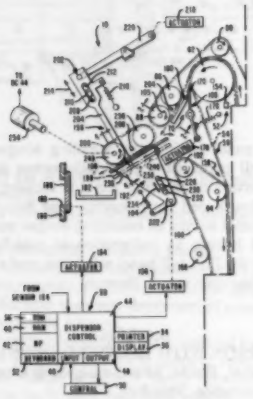
RECORD MEDIA DISPENSING APPARATUS

Harley J. Shawen, Kettering, and Richard P. Marvin, West Carrollton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 30, 1981, Ser. No. 335,916

Int. Cl.³ B07C 5/00; B65H 43/00

U.S. Cl. 209—534 **10 Claims**



1. A record media transporting mechanism comprising:

a first moving endless belt system having an advance side and a return side and also having a diversion point therebetween;

means for supplying record media to said advance side and also for cooperating with said advance side to transfer said record media to said diversion point;

a second moving endless belt system cooperating with said return side to provide an entry area and a discharge area with regard to said record media and also for transporting record media from said entry area to said discharge area;

a customer access receptacle; means for receiving and accumulating said record media received from said diversion point and also for selectively transferring said received and accumulated record media to said entry area or said customer access receptacle;

means located at said diversion point for diverting said record media into said entry area or said receiving, accumulating, and transferring means in response to a control signal; and

control means for generating said control signal and also for controlling the movement of said record media in said receiving, accumulating and transporting mechanism in response to predetermined criteria.

4,482,058

CONTROL CIRCUIT FOR BILL AND COIN CHANGER

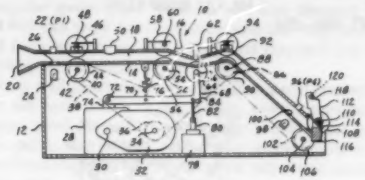
Larry E. Steiner, Grand Rapids, Mich., assignor to Rowe International, Inc., Grand Rapids, Mich.

Division of Ser. No. 74,992, Sep. 13, 1979, abandoned. This application May 17, 1982, Ser. No. 379,148

Int. Cl.³ B07C 5/00; G06K 9/00

U.S. Cl. 209—534 **1 Claim**

1. Apparatus for validating a bill having a predetermined length including in combination means defining a path having an inlet, means for advancing a bill introduced into said inlet at a predetermined speed along said path, means for sensing the presence of said bill at a predetermined location along said path, and means responsive to the deactuation of said sensing means within a predetermined period of time following the



initial actuation thereof less than the period required for a bill of said length moving at said speed to traverse said location for reversing the direction of movement of said bill to return said bill to said inlet.

4,482,059

SORTER WITH AUTOMATIC PUSH-OUT MECHANISM

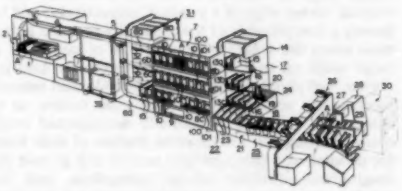
Tetsuo Horii, Kawasaki; Seietsu Nara, Yokohama, and Kazuhito Haruki, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 17, 1982, Ser. No. 349,689

Claims priority, application Japan, Feb. 18, 1981, 56-22789; Feb. 20, 1981, 56-23869

Int. Cl.³ B07C 7/06

U.S. Cl. 209—569 **4 Claims**



1. A sorter with an automatic removal apparatus comprising:

(a) means for reading out sorting information attached to documents;

(b) a plurality of stacking sections which are arranged in a plurality of stages in the vertical direction, which stack the documents, each of said stacking sections including a removal mechanism;

(c) means for sorting the documents to said plurality of stacking sections based on the sorting information read out by said reading means;

(d) a plurality of tray means intermittently displaceable at a predetermined rate relative said stacking section so as to be sequentially registrable with each of said stacking sections for receiving the documents removed from said stacking sections;

(e) preliminary stacking means having a removal mechanism for stacking the documents to be stacked at one of said stacking sections during the time in which the documents stacked in said one of said stacking sections are being removed therefrom;

(f) conveying means for conveying the documents to be stacked at said preliminary stacking means;

(g) means for detecting if the documents stacked at said stacking sections are under a removal permission status before a full-stack status or under the full-stack status;

(h) determining means for determining if a number of documents to be stacked at one of said stacking sections within a removal time after the removal permission status thereof

is more than a predetermined number so as to output a designation signal indicating that the documents should be stacked in the preliminary stacking means when the number is above the predetermined number;

(i) controlling means for (10) receiving the preliminary stacking means designation signal from said determining means, (2) supplying a first control signal to said conveying means so as to stack, at the preliminary stacking means, the documents to be stacked at said one of said stacking sections, and (3) outputting a second control signal when an empty one of said tray means is in opposing registry with said one of said stacking sections; and

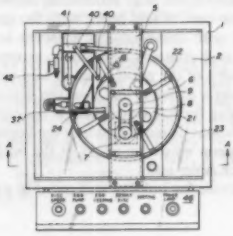
(j) driving means for driving, in response to said second control signal from said controlling means, said removal mechanism of said one stacking section to transfer the documents stacked in said one stacking section to said empty one of said tray means.

4,482,060

FISH-EGG SORTING APPARATUS

Masataka Tachibana, 6-9-305, Hanamigawa, Chiba-shi, Chiba, Japan

Filed May 19, 1982, Ser. No. 379,744
Int. Cl.³ B07C 5/342
U.S. Cl. 209—588 **8 Claims**



1. A fish-egg sorting apparatus comprising a frame, a rotary disc mounted on said frame, a feeder for feeding fish eggs to a position close to the center of said rotary disc, whereby upon rotation of said disc the fish eggs are moved by centrifugal force radially outwardly toward the periphery of said disc, a guide plate mounted on the frame and disposed along the outer periphery of said rotary disc for aligning said radially moved fish eggs in a row, means for detecting bad eggs in said row of eggs including an optical sensor, means for separating the bad eggs from the row of eggs in response to detection by said sensor, means for collecting the remaining good eggs, and driving means for rotating said rotary disc.

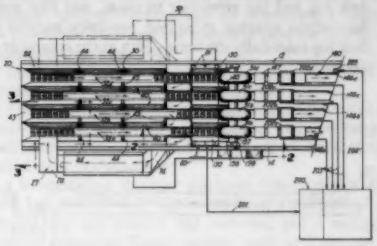
4,482,061

APPARATUS AND PROCESS FOR SORTING ARTICLES

William H. Leverett, Greenville, Ga., assignor to Durand-Wayland, Inc., LaGrange, Ga.

Continuation-in-part of Ser. No. 963,581, Nov. 24, 1978, Pat. No. 4,273,649, and a continuation-in-part of Ser. No. 79,429, Sep. 27, 1979, Pat. No. 4,262,807. This application Feb. 11, 1981, Ser. No. 233,338
Int. Cl.³ B07C 5/16
U.S. Cl. 209—592 **7 Claims**

3. In a process of sorting articles fed along a prescribed path by discharging articles of similar weight ranges in prescribed zones, and wherein a prescribed weight respectively forms a high weight cut off point for one adjacent drop zone and a low weight cut off point for another adjacent drop zone, the step of automatically adjusting the cut off points for a prescribed zone after a prescribed numbers of articles have been accumulated in each zone, according to the total weight of the prescribed number of articles so as to improve the probability that the next



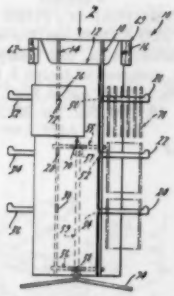
accumulation of the prescribed number of articles for that zone will more nearly approach said prescribed weight.

4,482,062

CARDED GOODS MERCHANDISER

David L. Huntsberry, Indian Head Park, Ill., assignor to Microdot Inc., Darien, Conn.

Filed Nov. 1, 1982, Ser. No. 438,032
Int. Cl.³ A47F 7/00
U.S. Cl. 211—57.1 **3 Claims**



1. A carded goods merchandiser comprising:

four substantially identical racks,

each of said racks having a plurality of horizontally extending vertically spaced and aligned integral fingers thereon and a like plurality of vertically spaced apertures, said apertures being horizontally aligned with the fingers thereof and vertically aligned with one another,

the fingers of each rack being accepted in the apertures of an adjacent normally related rack to retain said adjacent rack in a rigid free standing array and to provide display support for a plurality of merchandise cards.

4,482,063

COMPUTER TERMINAL SUPPORT AND HAND REST

Joseph J. Berke, 3333 East Jefferson, Detroit, Mich. 48207; Eric L. Gay, Ann Arbor, Mich., and Henry P. Doble, Jr., West Redding, Conn., assignors to Joseph J. Berke, Detroit, Mich.

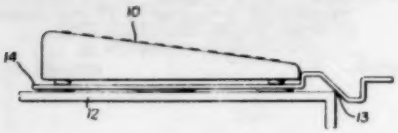
Division of Ser. No. 137,808, Apr. 4, 1980,. This application Dec. 18, 1981, Ser. No. 331,954
Int. Cl.³ A47F 7/100
U.S. Cl. 211—69.1 **13 Claims**

1. A computer terminal, keyboard or the like, and

a computer terminal support adapted to be placed on a desk top or the like, the desk top being of the type having a

generally flat upper surface terminating in a forward edge, the computer terminal support comprising:

a first generally flat section to be interposed between the desk top and the computer terminal, said first generally flat section adapted to extend generally parallel to the desk top essentially the same width as the computer terminal; and



a second section attached to said first section, said second section adapted to be interposed between the computer terminal and a computer terminal operator in close proximity to the computer terminal;

said second section extending side-to-side an amount generally the same as the width of the computer terminal;

said second section being at least partly positioned in a plane different from the plane of said first generally flat section.

4,482,064

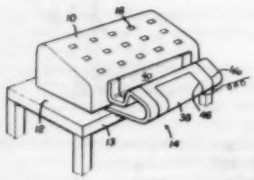
COMPUTER TERMINAL SUPPORT AND HAND REST

Joseph J. Berke, 3333 E. Jefferson, Detroit, Mich. 48207; Eric L. Gay, Ann Arbor, Mich., and Henry P. Doble, Jr., West Redding, Conn., assignors to Joseph J. Berke, Detroit, Mich.

Division of Ser. No. 137,808, Apr. 4, 1980,. This application Dec. 18, 1981, Ser. No. 331,956

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—69.1 **15 Claims**



1. A computer terminal, keyboard or the like, and

a computer terminal support adapted to be placed on a desk top or the like, the desk top being of the type having a generally flat upper surface terminating in a forward edge, the computer terminal support comprising:

a first generally flat section to be interposed between the desk top and the computer terminal, said first generally flat section adapted to extend generally parallel to the desk top; and

a second section attached to said first section,

said second section adapted to be interposed between the computer terminal and a computer terminal operator in close proximity to the computer terminal;

said second section extending side-to-side an amount generally the same as the width of the computer terminal;

said second section including a rest of narrow depth, front to back, for supporting the hands of the computer terminal operator during periods of non-use of the computer terminal;

said second section including a trough for the storage of pens, pencils, and the like.

4,482,065

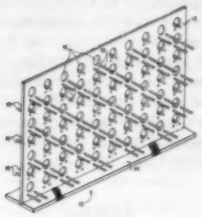
BOTTLE RACK

James L. Altemose, Malvern, Pa., assignor to Creative Environments, Inc., King of Prussia, Pa.

Continuation of Ser. No. 222,994, Jan. 6, 1981,. This application Sep. 28, 1982, Ser. No. 425,554

Int. Cl.³ B01D *33/00*

U.S. Cl. 211—74 **9 Claims**



1. A bottle rack adapted to receive bottles for displaying and storing comprising:

a panel having a plurality of holes arranged generally in rows and columns for receiving the necks of bottles and for restraining movement of the bottles through the holes;

a pair of spaced-apart pegs protruding outwardly from said panel below each of said holes, with the spaced-apart pegs associated with consecutively adjacent holes along both the rows and columns alternately protruding out from opposite sides of the panel, each of said pair of pegs being spaced apart a distance less than the diameter of the bottles and being further spaced below the center of said each hole a sufficient distance to allow the bodies of the bottles to rest thereon when the necks of the bottles are inserted in said each hole; and

support structure for holding said panel in a generally vertical plane.

4,482,066

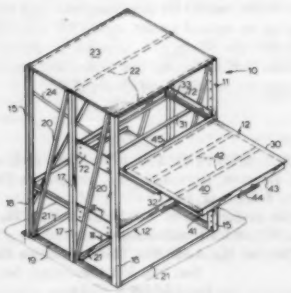
STORAGE RACK WITH AN EXTENDIBLE SHELF STRUCTURE

Donald P. Dykstra, 556 Lyman, DesPlaines, Ill. 60016

Filed Sep. 24, 1982, Ser. No. 423,250

Int. Cl.³ A47F *5/00*

U.S. Cl. 211—151 **14 Claims**



1. A storage rack having at least one storage shelf movable from a storage position to a fully extended position to enable loading and unloading of the shelf, said storage rack comprising a rack having a pair of side frame units of vertical frame members interconnected by transverse frame members, said side frame unit being interconnected by additional frame members to form the rack having an open front; and at least one

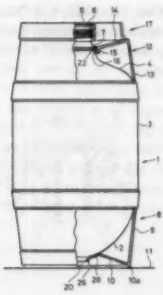
movable shelf assembly being disposed in said rack, each movable shelf assembly including a rigid carriage with an open end formed by a pair of side members interconnected by transverse carriage elements, a rigid shelf having a shelf surface supported by side elements interconnected by transverse shelf elements, first mounting means for mounting said rigid shelf for movement in a path in said carriage between a first position received in said carriage and a second position with a portion extending out of said open end of said carriage, and second mounting means for mounting said carriage in said rack for movement in a path between a third position retracted within the rack and a fourth position with a portion of the carriage extending out of said open front of said rack, said first mounting means including one of said side element and said side member at each side of the rigid shelf having means forming a first track and the other of said side member and side element having spaced rollers mounted in spaced relation thereon for engaging said track, said second mounting means including each side member of the carriage having means including a plate member for forming a pair of vertically spaced, horizontal track surfaces and each of the side frame units having spaced pairs of vertically spaced rollers arranged with the plate member extending therebetween and the rollers engaging said track surfaces to support the carriage as it moves between the third and fourth position so that with the shelf in a second position and the carriage in a fourth position, said shelf is fully extended out of the open front of the rack to enable loading and unloading the shelf without interference from the rack.

4,482,067

SYNTHETIC RESIN BOTTLE

Tadao Saito, Adachi, and Riichi Ogawa, Koto, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Japan

Continuation of Ser. No. 352,718, Feb. 26, 1982, abandoned.
This application Feb. 21, 1984, Ser. No. 580,767
Claims priority, application Japan, Mar. 5, 1981, 56-31199
Int. Cl.³ B65D *23/00, 21/02*
U.S. Cl. 215—12 R **7 Claims**



1. A synthetic resin container comprising:

(A) an integral, thin-walled, biaxially oriented bottle having a longitudinal axis and comprising a top portion, a cylindrical body portion and a semi-spherical bottom portion;

said top portion comprising a shoulder portion sloping from said cylindrical body portion toward said longitudinal axis, a first cylindrical neck portion extending along said longitudinal axis from said shoulder portion and comprising a radially outwardly extending flange, and a second cylindrical neck portion extending along said longitudinal axis from said first neck portion and comprising annular threads for securing a cap thereto; and

(B) an upper fitting member disposed symmetrically about said longitudinal axis and comprising a peripheral upper wall portion, a peripheral lower wall portion and a first inwardly extending flange defining a boundary between said peripheral upper wall portion and said peripheral lower wall portion;

said peripheral upper wall portion extending at least as high as said second cylindrical neck portion and having a part-circular opening therethrough for permitting a vessel to be passed therethrough and disposed adjacent said second cylindrical neck portion;

said peripheral lower wall portion comprising a lower end fitted to a periphery of said bottle; and

said first flange sloping towards said longitudinal axis and further comprising means for securing said first flange to said radially outwardly extending flange of said first cylindrical neck portion; and

(C) a lower fitting member disposed symmetrically about said longitudinal axis and comprising a peripheral wall having top and bottom end portions, and a second inwardly extending flange integral with said bottom end portion;

said top end portion being in fitting relationship with a periphery of said bottle;

said bottom end portion comprising a longitudinal cylindrical extension adapted for supporting said container in an upright position and having an outer diameter no larger than an inner diameter of said peripheral upper wall portion of said upper fitting member; and

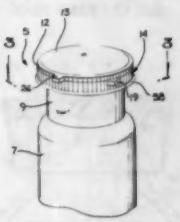
said second flange sloping towards said longitudinal axis, and comprising means for securing said second flange to said bottom portion of said bottle.

4,482,068

CHILD RESISTANT SAFETY CAP

Albert J. Agbay, Worcester, Mass., and Ralph H. Thomas, Sr., Clark, N.J., assignors to Robert Linkletter Associates, Inc., Westboro, Mass.

Filed Oct. 31, 1983, Ser. No. 547,107
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—225 **40 Claims**



1. A safety closure for a container having a rim defining an open mouth and a peripheral lip around the rim, said closure comprising:

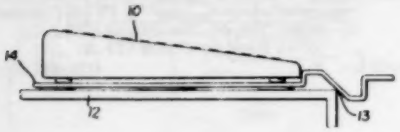
a cap having a top overlying said mouth and said rim and having a depending annular flange projecting below said top, said flange having an inwardly directed circumferential bead engaged below said lip, and an outwardly directed circumferential bead located below said top and cooperating therewith to define a circumferential locking groove extending around the outer side of said flange;

a rotary safety ring having an annular sidewall surrounding said flange and overlying said locking groove and said outwardly directed circumferential bead, said annular sidewall being closely spaced to said locking groove and said outwardly directed circumferential bead so that said inwardly directed bead is held in engagement with said lip and prevents removal of said cap;

a plurality of angularly spaced fingers on the inner side of said sidewall projecting into said locking groove and overlying the bottom wall of said groove to prevent downward movement of said ring along said cap, said fingers being inclined inwardly and downwardly into said

generally flat upper surface terminating in a forward edge, the computer terminal support comprising:

a first generally flat section to be interposed between the desk top and the computer terminal, said first generally flat section adapted to extend generally parallel to the desk top essentially the same width as the computer terminal; and



a second section attached to said first section, said second section adapted to be interposed between the computer terminal and a computer terminal operator in close proximity to the computer terminal;

said second section extending side-to-side an amount generally the same as the width of the computer terminal;

said second section being at least partly positioned in a plane different from the plane of said first generally flat section.

4,482,064

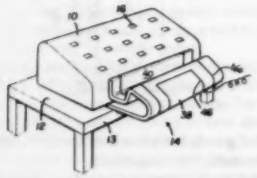
COMPUTER TERMINAL SUPPORT AND HAND REST

Joseph J. Berke, 3333 E. Jefferson, Detroit, Mich. 48207; Eric L. Gay, Ann Arbor, Mich., and Henry P. Doble, Jr., West Redding, Conn., assignors to Joseph J. Berke, Detroit, Mich.

Division of Ser. No. 137,808, Apr. 4, 1980,. This application Dec. 18, 1981, Ser. No. 331,956

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—69.1 **15 Claims**



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a first generally flat section to be interposed between the desk top and the computer terminal, said first generally flat section adapted to extend generally parallel to the desk top; and

a second section attached to said first section,

said second section adapted to be interposed between the computer terminal and a computer terminal operator in close proximity to the computer terminal;

said second section extending side-to-side an amount generally the same as the width of the computer terminal;

said second section including a rest of narrow depth, front to back, for supporting the hands of the computer terminal operator during periods of non-use of the computer terminal;

said second section including a trough for the storage of pens, pencils, and the like.

4,482,065

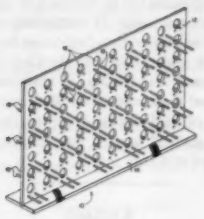
BOTTLE RACK

James L. Altemose, Malvern, Pa., assignor to Creative Environments, Inc., King of Prussia, Pa.

Continuation of Ser. No. 222,994, Jan. 6, 1981,. This application Sep. 28, 1982, Ser. No. 425,554

Int. Cl.³ B01D *33/00*

U.S. Cl. 211—74 **9 Claims**



1. A bottle rack adapted to receive bottles for displaying and storing comprising:

a panel having a plurality of holes arranged generally in rows and columns for receiving the necks of bottles and for restraining movement of the bottles through the holes;

a pair of spaced-apart pegs protruding outwardly from said panel below each of said holes, with the spaced-apart pegs associated with consecutively adjacent holes along both the rows and columns alternately protruding out from opposite sides of the panel, each of said pair of pegs being spaced apart a distance less than the diameter of the bottles and being further spaced below the center of said each hole a sufficient distance to allow the bodies of the bottles to rest thereon when the necks of the bottles are inserted in said each hole; and

support structure for holding said panel in a generally vertical plane.

4,482,066

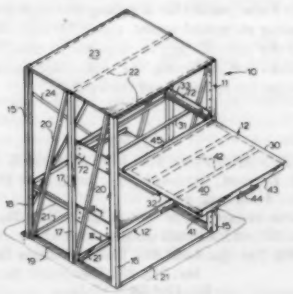
STORAGE RACK WITH AN EXTENDIBLE SHELF STRUCTURE

Donald P. Dykstra, 556 Lyman, DesPlaines, Ill. 60016

Filed Sep. 24, 1982, Ser. No. 423,250

Int. Cl.³ A47F *5/00*

U.S. Cl. 211—151 **14 Claims**



1. A storage rack having at least one storage shelf movable from a storage position to a fully extended position to enable loading and unloading of the shelf, said storage rack comprising a rack having a pair of side frame units of vertical frame members interconnected by transverse frame members, said side frame unit being interconnected by additional frame members to form the rack having an open front; and at least one

movable shelf assembly being disposed in said rack, each movable shelf assembly including a rigid carriage with an open end formed by a pair of side members interconnected by transverse carriage elements, a rigid shelf having a shelf surface supported by side elements interconnected by transverse shelf elements, first mounting means for mounting said rigid shelf for movement in a path in said carriage between a first position received in said carriage and a second position with a portion extending out of said open end of said carriage, and second mounting means for mounting said carriage in said rack for movement in a path between a third position retracted within the rack and a fourth position with a portion of the carriage extending out of said open front of said rack, said first mounting means including one of said side element and said side member at each side of the rigid shelf having means forming a first track and the other of said side member and side element having spaced rollers mounted in spaced relation thereon for engaging said track, said second mounting means including each side member of the carriage having means including a plate member for forming a pair of vertically spaced, horizontal track surfaces and each of the side frame units having spaced pairs of vertically spaced rollers arranged with the plate member extending therebetween and the rollers engaging said track surfaces to support the carriage as it moves between the third and fourth position so that with the shelf in a second position and the carriage in a fourth position, said shelf is fully extended out of the open front of the rack to enable loading and unloading the shelf without interference from the rack.

4,482,067

SYNTHETIC RESIN BOTTLE

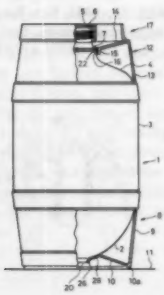
Tadao Saito, Adachi, and Riichi Ogawa, Koto, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Japan

Continuation of Ser. No. 352,718, Feb. 26, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 580,767

Claims priority, application Japan, Mar. 5, 1981, 56-31199

Int. Cl.³ B65D *23/00, 21/02*

U.S. Cl. 215—12 R **7 Claims**



1. A synthetic resin container comprising:

(A) an integral, thin-walled, biaxially oriented bottle having a longitudinal axis and comprising a top portion, a cylindrical body portion and a semi-spherical bottom portion;

said top portion comprising a shoulder portion sloping from said cylindrical body portion toward said longitudinal axis, a first cylindrical neck portion extending along said longitudinal axis from said shoulder portion and comprising a radially outwardly extending flange, and a second cylindrical neck portion extending along said longitudinal axis from said first neck portion and comprising annular threads for securing a cap thereto; and

(B) an upper fitting member disposed symmetrically about said longitudinal axis and comprising a peripheral upper wall portion, a peripheral lower wall portion and a first inwardly extending flange defining a boundary between said peripheral upper wall portion and said peripheral lower wall portion;

said peripheral upper wall portion extending at least as high as said second cylindrical neck portion and having a part-circular opening therethrough for permitting a vessel to be passed therethrough and disposed adjacent said second cylindrical neck portion;

said peripheral lower wall portion comprising a lower end fitted to a periphery of said bottle; and

said first flange sloping towards said longitudinal axis and further comprising means for securing said first flange to said radially outwardly extending flange of said first cylindrical neck portion; and

(C) a lower fitting member disposed symmetrically about said longitudinal axis and comprising a peripheral wall having top and bottom end portions, and a second inwardly extending flange integral with said bottom end portion;

said top end portion being in fitting relationship with a periphery of said bottle;

said bottom end portion comprising a longitudinal cylindrical extension adapted for supporting said container in an upright position and having an outer diameter no larger than an inner diameter of said peripheral upper wall portion of said upper fitting member; and

said second flange sloping towards said longitudinal axis, and comprising means for securing said second flange to said bottom portion of said bottle.

4,482,068

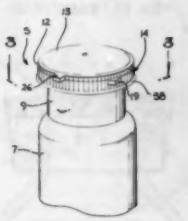
CHILD RESISTANT SAFETY CAP

Albert J. Agbay, Worcester, Mass., and Ralph H. Thomas, Sr., Clark, N.J., assignors to Robert Linkletter Associates, Inc., Westboro, Mass.

Filed Oct. 31, 1983, Ser. No. 547,107

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—225 **40 Claims**



1. A safety closure for a container having a rim defining an open mouth and a peripheral lip around the rim, said closure comprising:

a cap having a top overlying said mouth and said rim and having a depending annular flange projecting below said top, said flange having an inwardly directed circumferential bead engaged below said lip, and an outwardly directed circumferential bead located below said top and cooperating therewith to define a circumferential locking groove extending around the outer side of said flange;

a rotary safety ring having an annular sidewall surrounding said flange and overlying said locking groove and said outwardly directed circumferential bead, said annular sidewall being closely spaced to said locking groove and said outwardly directed circumferential bead so that said inwardly directed bead is held in engagement with said lip and prevents removal of said cap;

a plurality of angularly spaced fingers on the inner side of said sidewall projecting into said locking groove and overlying the bottom wall of said groove to prevent downward movement of said ring along said cap, said fingers being inclined inwardly and downwardly into said

locking groove having free inner ends positioned to be wedged against the bottom of the locking groove to prevent free flexing of the fingers as the ring is pulled downwardly relative to the cap, thereby normally preventing downward movement of said ring out of overlying relation with said locking groove;

a plurality of longitudinally extending release grooves in said outwardly directed circumferential bead, spaced and sized to permit movement of said fingers through said outwardly directed circumferential bead in one angular position of said ring about said cap, and thus allowing downward movement of said ring away from said cap for the removal of the latter from the container in said one angular position; and

an annular protrusion projecting from the surface of the underside of said top, said protrusion having a diameter slightly less than the inside diameter of said rim so that said protrusion closely abuts said rim when said cap is securely closed on said container;

whereby a safety closure with an improved liquid-tight seal is disclosed.

4,482,069

CAP CLOSURE INCLUDING PIERCEABLE SEALING ELEMENT

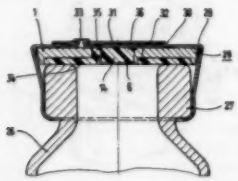
Reinhard Stadler, Karlsruhe, Fed. Rep. of Germany, assignor to Gesepa Anstalt Für Patentverwertung, Vaduz, Liechtenstein

Filed Jan. 26, 1983, Ser. No. 461,974

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203176; Apr. 5, 1982, 3212685; Oct. 23, 1982, 3239302

Int. Cl.³ B65D *39/00*

U.S. Cl. 215—249 **22 Claims**



1. In a cap closure for a pharmaceutical container having a neck, said cap closure being of the type including a pierceable sealing element for sealing the container neck, and a closing cap covering said sealing element and engageable with the container neck, the improvement wherein said sealing element comprises:

a supporting member having a first side, a second side and at least one passage extending through said supporting member from said first side thereof to said second side thereof, said supporting member forming a skeleton of said sealing element; and

an elastic filling member injection molded and rigidly fixed to said supporting member, said filling member including a first portion on said first side of said supporting member, a second portion on said second side of said supporting member, and a connecting portion integral with said first and second portions and extending through said passage in said supporting member, said second portion of said filling member having an annular configuration and defining a seal adapted to seal the container neck.

4,482,070

SAFETY CLOSURE CAP FOR BOTTLES

Werner F. Dubach, Maur, Switzerland, assignor to Alfatechnic AG, Switzerland

Filed Jul. 1, 1983, Ser. No. 510,222

Claims priority, application Switzerland, Jul. 2, 1982, 4045/82; Apr. 15, 1983, 2023/83

Int. Cl.³ B65D *41/58*

U.S. Cl. 215—253 **20 Claims**

1. A closure cap for hollow vessels having a narrow neck portion having a radially extending beaded rim at the vessel opening, said closure cap in its attached position extending over said opening and beaded rim and having peripheral downwardly extending walls in sealing engagement with the lower edge of said beaded portion, said closure cap extending over said opening and having a detachable portion, said closure cap characterized by having said detachable portion defined by a breaking line (**8, 58**) of reduced strength of material in a bottom (**6, 56**) of said cap, the outer surface (**9, 59**) of said detachable portion of said cap bottom (**6, 56**) is stepped with respect to upper surface (**10**) of said peripheral wall (**7,54**), enabling a displacement motion of said detachable portion relative to said peripheral wall causing breaking along said breaking line.

4,482,071

SEALING AID FOR FASTENING A RESILIENT PLUG INSERTED INTO AN OPENING OF A CONTAINER

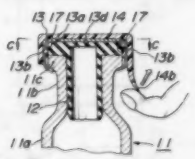
Shiro Ishiwatari, Hino, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Oct. 13, 1982, Ser. No. 434,107

Claims priority, application Japan, Oct. 16, 1981, 56-153657

Int. Cl.³ B65D *41/42*

U.S. Cl. 215—255 **4 Claims**



1. A sealing aid for fastening an elastic plug inserted into an opening of a container having a neck portion and a main body connected to the neck portion comprising

a seal cap means made of relatively hard material and being connectable to the neck portion of the container in such a manner that a peripheral portion of said seal cap means is bent corresponding to an outer contour of the neck portion of the container so as to fix said seal cap means to said container to prevent the plug from being removed from the container; which seal cap means has a cutout line defining a tongue portion, and

an outer cap means made of elastic material and connected partially to said seal cap means, said outer cap means covering the seal cap means;

whereby said seal cap means is connected to said outer cap means at two diagonally opposing positions, one position situating within the tongue portion and the other position

situating outside the tongue portion, whereby when the outer cap means is removed from the container, all the seal cap means is removed from the container together with the outer cap means only by a single operation.

4,482,072

PRESSURIZING APPARATUS FOR PARTIALLY FILLED CONTAINERS

Ronald W. Hankins, 1882 Fleming St., Pomona, Calif. 91766

Filed May 12, 1983, Ser. No. 493,777
Int. Cl.³ B65D *39/12*
U.S. Cl. 215—269 **8 Claims**

1. A container closure apparatus which permits both the introduction and removal of a pressurized gas from an expandable bladder locatable within the unfilled portion of a partially filled product container, which comprises:

a removable container closure having means for affixing said closure to a product container said closure having a gas passageway therethrough said gas passageway having an exterior end and an interior end;

air valve apparatus located within said gas passageway, said air valve apparatus comprising a downwardly depending tubular member having a lower opening open to an expandable bladder and having an axially movable valve element held axially therein, said valve element having an upper opening for the insertion of tapered spout means and being biased upwardly and having valve seat means which stops the passage of gas when said valve element is in its upward position and permit the flow of gas when said valve element is in a lower position; and

an expandable bladder affixed to the interior end of said container closure.

4,482,073

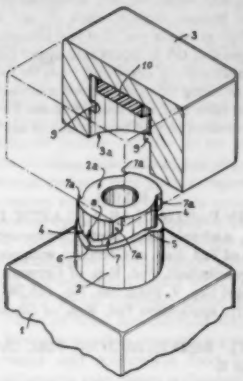
SYSTEM FOR RETAINING A CAP WITH RESPECT TO THE NECK OF A RECIPIENT

Jean Claude Gagliardi, Oyonnax, France, assignor to M.B.F. Plastiques, Oyonnax, France

Filed Nov. 1, 1983, Ser. No. 547,692
Claims priority, application France, Nov. 18, 1982, 82 19624
Int. Cl.³ B65D *41/06, 41/36*
U.S. Cl. 215—332 **8 Claims**

1. In a system for retaining a cap with respect to the neck of a recipient of the type comprising means for angularly orienting the cap with respect to the neck,

said neck comprises two symmetrical ramps each of which starts from two diametrically opposite top points where it is interrupted, to terminate at a bottom point where a locking means incorporating a notch is provided, whilst the cap is provided with two diametrically opposite, inwardly facing catches which penetrate under the ramps so that, during its rotation, the cap is applied against the neck



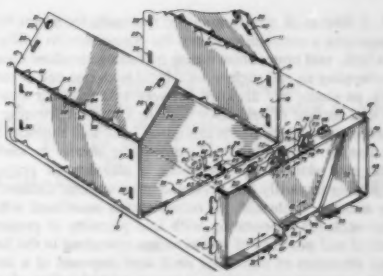
and locked in a desired angular position determined by the notched locking means.

4,482,074

MULTIPURPOSE CONTAINER

Donald P. Lalley, 2017 N. 81st Pl., Scottsdale, Ariz. 85257

Filed Jan. 5, 1983, Ser. No. 455,656
Int. Cl.³ B65D *6/00*
U.S. Cl. 220—4 F **9 Claims**



1. A multipurpose container comprising a first header member, a second header member disposed in spaced substantially parallel relationship to said first header member, each of said header members comprising a generally rectangular frame having an inner face, an outer face, an upper surface, first and second side surfaces, and a lower surface, said lower surface having a recess defined therein intermediate said first and second side surfaces, said recess having side walls and a back wall portion interconnecting said side walls, said back wall having first and second key members and a snub member attached thereto, said key members being disposed in spaced parallel relationship to each other intermediate said side walls, said snub member being disposed intermediate said key members in elevated relationship thereto; a rectangular body blank having uniform edges thereupon and a first top portion, a first side portion, a bottom portion, a second side portion and a second top portion defined therein, said contiguous portions having seam lines interposed therebetween, said blank being foldable to form a hollow rectangular body having a first and second open end; said body blank having a foldable tab defined in each of said uniform edges in registry with said recess in said adjacent header member, each said tab having an upper edge, a seam line in spaced substantially parallel relationship to said

upper edge, and first and second openings defined therein, said openings being disposed respectively in registered relationship with said first and said second key member so that when said tab is folded on said seam line into substantially normal relationship to said bottom portion, each of said key members penetrates a different one of said first and second openings and said snub engages said tab adjacent said upper edge to restrain said tab from involuntarily departing from its folded position; first means for securing said first header member to said body blank in said first open end; and second means for securing said second header member to said body blank in said second open end.

4,482,075

FUEL TANK IN PARTICULAR A PLASTIC FUEL TANK

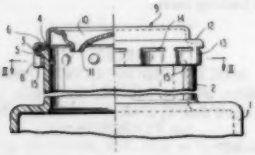
Manfred Stotz, Aichwald, and Dieter Scheurenbrand, Wolfschlugen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,246

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3135982

Int. Cl.[3] **B65D** *25/20, 51/00;* **F16L** *55/00*

U.S. Cl. 220—86 R **13 Claims**



1. A filler neck arrangement for fuel tanks for motor vehicles comprising a connecting means for connection to a filler neck of a tank, said connection means including shoulder means for overlapping an end surface associated with one end of the filler neck, an elastic seal disposed between said shoulder means and the end surface of said filler neck in a manner forming a seal therebetween, skirt means extending from said shoulder means for fixedly connecting said connecting means to said filler neck, said skirt means including a plurality of projections projecting inwardly and arranged at an angular distance from one another, a plurality of recess means associated with said filler neck for cooperating with said plurality of projections, each of said plurality of recess means extending in the longitudinal direction of said filler neck and disposed at a distance relative to said end surface, wherein said plurality of projections engage with said plurality of recess means in a form-locking manner for fixed attachment of said connecting means to said filler neck, said connecting means including means for releasably securing a cap for said filler neck arrangement.

4,482,076

NOZZLE PLUG FOR SUBMERSIBLE VESSEL

Timothy H. Wentzell, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 8,660, Feb. 2, 1979, abandoned. This application Feb. 17, 1982, Ser. No. 349,565

Int. Cl.[3] **F16L** *55/12*

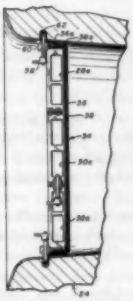
U.S. Cl. 220—232 **8 Claims**

1. A plug means operative to effect a temporary blockage of a nozzle having a passage formed therein defined by the internal surface of the nozzle so as to prevent the flow of liquid through the passage in the nozzle comprising:

(a.) a plurality of interconnectable sections of plate having a first and a second state of assembly, said first state of assembly corresponding to the unassembled condition of said purality of interconnectable sections of plate, when in said unassembled condition each of said plurality of interconnectable sections of plate being of sufficiently small size so as to be insertable within the passage, said second state of assembly corresponding to the assembled condition of said plurality of interconnectable sections of plate, when in said assembled condition said plurality of interconnectable sections of plate embodying a cross sectional area substantially the same as the cross-sectional area of the passage, each of said plurality of interconnectable sections of plate embodying a plurality of surfaces, first means formed in one of said plurality of surfaces of each of said plurality of interconnectable sections of plate, second means formed in another of said plurality of surfaces of each of said plurality of interconnectable sections of plate;

(b.) a member formed of a leakproof material and embodying a rim in the form of an inflatable bead, when said plurality of interconnectable sections of plate are in said assembled condition thereof said member being placed in mounted relation on said plurality of interconnectable sections of plate thereby to effect a liquid tight seal of said plurality of interconnectable sections of plate when said plurality of interconnectable sections of plate are in said assembled condition thereof;

(c.) interconnecting means for effecting the interconnection of said plurality of interconnectable sections of plate so as to effect the assembly of said plurality of interconnectable sections of plate into said assembled condition thereof, said interconnecting means comprising a first plurality of



fasteners, said first plurality of fasteners when received in said first means of said plurality of interconnectable sections of plate being operative to effect the interconnection of adjoining ones of said plurality of interconnectable sections of plate;

(d.) securing means for securing said plurality of interconnectable sections of plate when in said assembled condition thereof within the passage in blocking relation to the flow of liquid therethrough, said securing means comprising a second plurality of fasteners, said second plurality of fasteners when received in said second means of said plurality of interconnectable sections of plate being operative to secure said plurality of interconnectable sections of plate in place within the passage such that said plurality of interconnectable sections of plate are prevented from moving relative to the internal surface of the nozzle; and

(e.) inflation means connected to said inflatable bead of said member and also connectable to an external source of an inflation medium, said inflation means being operative to inflate said inflatable bead when said plurality of interconnectable sections of plate are secured in the passage by said second plurality of fasteners such as to effect the establishment of a liquid tight seal between said inflatable bead of said member and the passage defined by the internal surface of the nozzle so as to thereby accomplish a temporary blockage of the flow of liquid through the passage in the nozzle.

4,482,077

PERFORATED COVER ASSEMBLY

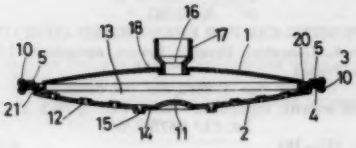
Henning M. Henderson, 2 Club View, corner Nigel & Hills Rds., Selection Park, Springs, Transvaal Province, South Africa

Filed Nov. 17, 1983, Ser. No. 552,684

Claims priority, application South Africa, Nov. 23, 1982, 82/8620; Jun. 22, 1983, 83/4553

Int. Cl.³ B65D 51/16

U.S. Cl. 220—374 14 Claims



1. A perforated cover assembly comprising two perforated shell members releasably held together at their peripheries to define a space therebetween and wherein one of the shell members is adapted to be uppermost in use, and the other is adapted to be lowermost in use, the operatively upper shell member having at least one perforation therethrough, and the operatively lower shell member being dished to form an operatively lower central region, having at least one drainage perforation therethough, and having a plurality of outlet perforations spread over at least a major part of the remaining surface area thereof, the outlet perforations each communicating with the interior of the cover assembly at a position raised with respect to the surrounding inner surface of said operatively lower shell member, the perforations in the two shell members being arranged relative to each other to obstruct the direct passage of liquids and solids through the cover assembly.

4,482,078

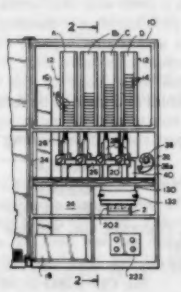
HOT/COLD FOOD DISPENSING MACHINE

Linda Reiss, c/o Eastern Electric, Inc., P.O. Box 1277, Framingham, Mass. 01701

Filed Jul. 13, 1981, Ser. No. 282,244

Int. Cl.³ G07F 11/72

U.S. Cl. 221—150 HC 1 Claim



1. A food dispensing machine comprising a cabinet, a refrigeration compartment disposed in an upper portion of said cabinet, including storage means in said refrigeration compartment storing articles of food; a food guide compartment disposed in a central portion of said cabinet, including selection means for selecting an article of food from said storage means and guide means for guiding such article generally downwards; and a food dispensing compartment disposed in said cabinet below said food guide compartment, including a microwave food heating device for selectively automatically heating articles of food, as desired by a user, means for receiving an article of food from said guide means and depositing the same into a cooking section of said microwave food heating device, means for controlling a heating and cooking cycle of said device in response to said article of food being so deposited into said cooking section, means for automatically ejecting the heated article of food at the end of a heating and cooking cycle, receptable means for receiving the ejected article and presenting the same to the user, and means for permitting evaporated moisture generated during a heating and cooking cycle to escape from said cooking section; wherein said refrigeration compartment further includes means preventing condensed moisture forming therein from dripping into said food guide compartment, and said food guide compartment includes means for preventing evaporated moisture generated during a heating and cooking cycle from dripping, as condensate, into said microwave food heating device, thereby minimizing the prospect of moisture-caused misoperation during periods of repeated use; the last-mentioned means for preventing including deflectable gate means disposed above said means for receiving an article of food for catching any condensation drips forming thereabove, while permitting articles of food to pass freely toward said microwave food heating device, wherein said deflectable gate means is disposed within a food article slide assembly above said means for receiving, said deflectable gate means includes a downwardly inclined surface, and said slide assembly includes a trough at a lower edge of said surface to catch moisture intercepted by said gate means.

4,482,079

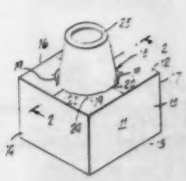
DISPOSABLE CUP DISPENSER

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River-Dixie/Northern, Inc., Norwalk, Conn.

Filed Dec. 16, 1982, Ser. No. 449,021

Int. Cl.³ B65D 5/16

U.S. Cl. 221—310 7 Claims



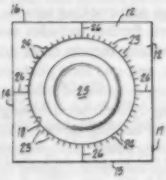
1. A dispenser carton for packaging and separately dispensing a cup from a stack of rimmed tapered disposable cups each of which has a tapered sidewall, a bottom wall, and an open top surrounded by a rolled rim, comprising a container carton having substantially square planar parallel mutually spaced top and bottom walls and connecting rectangular side walls; a generally circular opening in the top wall of said carton of a size sufficient to permit the bottom and tapered sidewall of a cup to extend freely therethrough and insufficient in size for passage of the rim of a cup freely therethrough; and a plurality of concave arcuate jaws defining a part of said opening and lying in the plane of said top wall while a cup is projecting through said opening and capable of being deflected in the direction of movement of a cup through said opening to permit passage of a cup therethrough by flexure of said jaws, each of said arcuate jaws subtending an angle of 40° to 45°.

4,482,080

CUP DISPENSER

Thomas D. Pawlowski, Neenah, Wis., and Joseph J. Vaxmonsky, Wanaque, N.J., assignors to James River-Dixie/-Northern, Inc., Norwalk, Conn.

Filed Dec. 16, 1982, Ser. No. 449,022
Int. Cl.³ B65D 5/16
U.S. Cl. 221—310 **4 Claims**



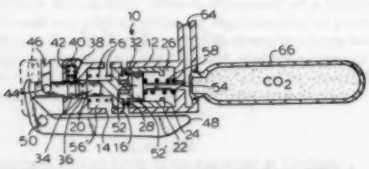
1. In a dispenser package structure for packaging and separately dispensing from a stack rimmed tapered disposable cups each of which has a tapered sidewall, a bottom, and an open top surrounded by a rolled rim comprising a container having substantially square planar, parallel, mutually spaced top and bottom walls; and connecting rectangular side walls, a circular opening in the top wall of a size sufficient to permit the bottom and tapered side wall of a cup to extend freely therethrough and insufficient to permit passage of the rim of a cup therethrough, and a plurality of relatively short radial slits or knife cuts surrounding said opening in said top wall defining a plurality of flexible tabs lying in the plane of said top wall and capable of being deflected in the direction of movement of a cup through said opening to permit passage of a cup therethrough by flexure of said tabs, the improvement comprising an elongated radial slit extending from the edge of said opening in said top to the mid point of each of said sidewalls, said elongated radial slits extending beyond all of the intervening radial slits defining the tabs surrounding the opening.

4,482,081

WATER ACTIVATED INFLATION MECHANISM

Daniel H. Meggs, La Mirada, Calif., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 430,536
Int. Cl.³ B67B 7/24
U.S. Cl. 222—5 **10 Claims**



1. An inflation mechanism comprising:

a cartridge of compressed gas;

a housing, said cartridge being mounted to said housing;

means for puncturing said cartridge including a piercing pin;

a first chamber within said housing including a water-actuable chemical therein which produces a gas upon contact with water;

a second chamber within said housing;

a piston slidably mounted within said housing, said piercing pin being mounted to said piston, a wall of said first chamber being defined by said piston such that said piston is urged towards said cartridge when gas is produced by the reaction of said chemical with water;

a movable wall within said housing defining a wall of said second chamber, said movable wall being urged away from said cartridge upon the production of gas when said chemical reacts with water;

means for allowing the entrance of water into said first chamber;

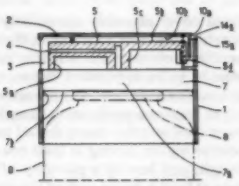
means for allowing the entrance of water into said second chamber and means for preventing the exit of water therefrom, said piston being capable of moving closer to said cartridge when said second chamber is filled with water than when it is not.

4,482,082

DISPENSING CAP FOR PRESSURIZED CONTAINER

Antonin L. Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Nov. 2, 1982, Ser. No. 438,635
Claims priority, application France, Dec. 3, 1981, 81 22649
Int. Cl.³ B67B 5/00
U.S. Cl. 222—182 **9 Claims**



1. In a dispensing cap for a pressurized container, comprising:

(a) an upper wall

(b) a lateral wall around said upper wall;

(c) a push button with said lateral wall and having an upper face below and close to said upper wall;

(d) a pilfer-proofing plate having an upper external face and a lower internal face and arranged above the push button frangible connections connecting said plate to the rest of the cap;

(e) a return to said pilfer-proofing plate at its extremity near the lateral wall of the cap; and

(f) means for permitting easy gripping of said pilfer-proofing plate in order to tear it off, the improvement wherein:

(g) said return is flush with said lateral wall; and

(h) said pilfer-proofing plate presenting, at this end, a cut-out defining, on said return, a panel capable of hinging by elastic deformation to move aside at least partially and to permit access to an edge of the cut-out which, once gripped, enables said plate to be torn away to gain access to the push button, said cut-out comprising a substantially horizontal part and two descending limbs.

4,482,083

COFFEE SAVER

Michel D. Beck, Norcross, Ga., assignor to Bernice M. Beck, Glendale, Calif.

Filed Sep. 30, 1982, Ser. No. 431,728
Int. Cl.³ B65D 25/40
U.S. Cl. 222—500 **11 Claims**

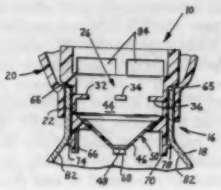
1. A device for use with a container for liquid, said container having a neck which defines an opening, said device comprising:

a sleeve adapted to fit in sealing relationship with said opening,

a member disposed in said sleeve and movable within said sleeve between a first position and a second position, said member having an opening;

said member being in said first position when said container is in an upright position, whereby liquid can be added to said container through said opening in said member and

the escape of vapors from liquid contained in said container through said sleeve is substantially restricted by said member; and



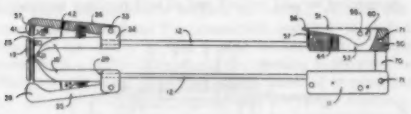
said member being in said second position when said container is tipped to pour liquid therefrom, whereby liquid in said container can flow past said member between said sleeve and said member.

4,482,084

DRESSING DEVICE

Gerald S. Beskin, 1401 Pennsylvania NE. #1029-A, Albuquerque, N. Mex. 87110

Filed Nov. 29, 1982, Ser. No. 445,352
Int. Cl.³ A47J *51/06*
U.S. Cl. 223—111 **10 Claims**



1. An apparatus for remotely pulling on and removing garments comprising:

a pair of elongated shafts each having an upper and lower end;

clamping means including open biased inner and outer crescent shaped jaws lateral to said shafts and hingedly mounted to each other, said jaws each having convex and concave surfaces, the convex surface of said inner jaw meshing with the concave surface of said outer jaw, said clamping means defining an opening through which a human foot may pass when the concave surfaces of said inner jaws are aligned to face each other, said inner jaws being rigidly fixed to said shafts; and

handle means attached to said shaft upper ends, including means attached to the outer jaws of said clamping means to remotely open and close the jaws of said clamping means.

4,482,085

TAPE DRIVING MECHANISM FOR A TAPE RECORDER

Shinsaku Tanaka, and Tadao Arata, both of Tokyo, Japan, assignors to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1983, Ser. No. 461,603
Claims priority, application Japan, Jan. 28, 1982, 57-10800[U]
Int. Cl.³ B65H *17/22*
U.S. Cl. 226—187 **14 Claims**

1. A tape driving mechanism for a tape recorder comprising:

a pin projecting upright from a base plate of the tape recorder;

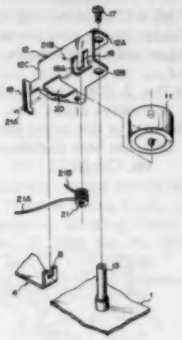
a capstan shaft rotatably mounted on said base plate;

a pinch roller holder having two end portions, one end portion thereof being rotatably supported on said pin, said pin defining a rotation axis of said pinch roller holder;

a pinch roller rotatably mounted on the other end portion of said pinch roller holder opposite said pin and spaced from said one end of said pinch roller holder;

a torsion coil spring having an intermediate coil portion held by said pinch roller holder and two end portions; and

an urging member for urging an end portion of said torsion coil spring to rotate and urge said pinch roller holder to rotate about said rotation axis to thereby urge said pinch roller against said capstan shaft;



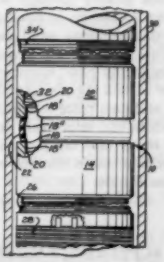
said pinch roller holder having a spring support portion spaced from said rotation axis on which said coil portion of said torsion coil spring is supported at a position away from said rotation axis of said pinch roller holder; and a pair of spring holding portions arranged away from said rotation axis for holding both end portions of said torsion coil spring against an urging force produced by said coil portion of said torsion coil spring.

4,482,086

EXPANDABLE PACKER ASSEMBLY FOR SEALING A WELL SCREEN TO A CASING

Walter R. Wagner, Minneapolis, and Leslie K. Bearl, Anoka, both of Minn., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 4, 1983, Ser. No. 520,267
Int. Cl.³ F16J *15/06*
U.S. Cl. 277—12 **8 Claims**



1. An expandable packer assembly for sealing a well screen member relative to the inner surface of a tubular casing member, said packer assembly including a pair of annular end portions, at least the lower of which includes fastening means adapted to be attached to the upper end of a well screen, said pair of end portions being axially joined to each other solely by an axially compressible tubular portion which has a relatively thin wall compared to said end portions and which is attached to said end portions at its ends in sealing relation thereto, said axially compressible tubular portion having at least one radially outwardly directed, annular intermediate region, said annular intermediate region being shaped so that it will be compressed in an axial direction and expanded outwardly in a radial direction when a predetermined amount of downward

force is applied to the upper one of said pair of annular end members relative to the lower one, said annular intermediate region being relatively inelastic so that it will remain compressed when said downward force is removed

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4,482,087

TAG ATTACHING DEVICE

Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.

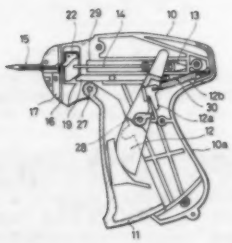
Filed Dec. 2, 1981, Ser. No. 326,953

Claims priority, application Japan, Dec. 12, 1980, 55-175426

The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.

Int. Cl.[3] **B25C** *1/00*

U.S. Cl. 227—67 **3 Claims**



1. A tag attaching device for dispensing tag pins joined to a connecting bar which form a tag pin assembly, each said tag pin having a crossbar connected by a filament to a head portion, comprising a main body, operation means supported on said main body for actuating said tag attacher, a hollow needle fixed to said main body, a guide groove formed at the rear side of said hollow needle in said main body, said operation means, when actuated, acting to drive a crossbar of a tag pin into said hollow needle, a cam plate reciprocably disposed adjacent said guide groove so as to be actuatable by said operation means to move between upper and lower positions, an engaging pawl having a sharp front end pivotally mounted to said cam plate and facing said guide groove through which said connecting bar of said tag pin assembly is passed, and spring means mounted between said engaging pawl and said main body for biasing said cam plate towards said lower position, said sharp front end of said engaging pawl member positively engaging said connecting bar of said tag pin assembly when in an upper position so that as said cam plate is actuated by said operation means, said sharp front end selectively positively engages said connecting bar to move said tag pin assembly downward to said lower position to position another tag pin for dispensing through said hollow needle.

4,482,088

MEANS FOR SUPPLYING FASTENERS IN A TAG ATTACHING APPARATUS

Kyu H. Hyun, Minyong Apt., Block "Q", Room No. 606, 301-112, Ichon-dong, Yongsan-ku, Seoul, Rep. of Korea

Filed May 5, 1982, Ser. No. 375,185

Claims priority, application Rep. of Korea, Jun. 21, 1981, 4601

Int. Cl.[3] **A43D** *69/00*

U.S. Cl. 227—67 **1 Claim**

1. A tag attaching apparatus comprising:

(a) a frame (1);

(b) a hollow needle (2) for attaching fasteners (5), said hollow needle (2) being mounted on the front of said frame (1);

(c) a fastener supply gear wheel (3) mounted on said frame (1) in position to supply fasteners (5) to said hollow needle (2), said fasteners (5) being supplied to said fastener supply gear wheel (3) through an aperture (4) in said frame (1) located between said fastener supply gear wheel (3) and the rear end of said hollow needle (2);

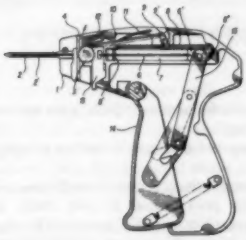
(d) a plunger (8) mounted in a driving home (7) in said frame (1) behind said fastener supply gear wheel (3), said plunger (8) having a base which is disposed parallel to said hollow needle (2), a front edge portion (8′) which projects from said base perpendicularly to said hollow needle (2), and a rear edge portion (8″) which projects from said base perpendicularly to said hollow needle on the same side of said base as said front edge portion (8′), said plunger (8) being slidably movable in said driving home (7) in the direction parallel to said hollow needle (2);

(e) a hinge portion (6′) mounted in said plunger (8) in engagement with said rear edge portion (8″);

(f) a pressing pole (6) which projectss forwardly from said hinge portion (6′) in the direction parallel to said hollow needle (2), said pressing pole (6) projecting through said front edge portion (8′);

(g) a pushing member (9) pivotably mounted on a pin which is in turn is mounted in said frame (1), said pin being perpendicular to said hollow needle (2), said pushing member having a front end which is engaged in a slot (9′) in said base such that motion of said plunger (8) in the forward and rearward directions causes said pushing member (9) to pivot about said pin, said pushing member (9) having a second end which extends on the opposite side of said pin from said first end;

(h) a pushing bar (10) the rearward end of which is pivotably connected to said second end of said pushing member (9)



and the forward end of which drivingly engages said fastener supply gear wheel (3);

(i) a spring (11) which is mounted on said frame (1) and which biases said pushing bar (10) into engagement with said fastener supply gear wheel (3);

(j) a locking member (12) in the form of a pawl which prevents reverse motion of said fastener supply gear wheel (3), said locking member (12) being pivotably mounted on said frame (1) and having a spring leg which resiliently biases said locking member into engagement with said fastener supply gear wheel (3);

(k) an unloosing member (13) mounted in said frame (1) between said fastener supply gear wheel (3) and the forward end of said pressing pole (6), said unloosing member (13) being slidably movable in said frame (1) in the direction perpendicular to said hollow needle (2), said unloosing member (13) being positioned such that, when it is pushed upwardly, it engages said locking member (12) and separates it from said fastener supply gear wheel (3);

(l) manually manipulatable lever means (14, 15) mounted on said frame (1) for forcing said hinge portion (6′) forwardly so that said pressing pole (6) pushes one of the fasteners (5) into said hollow needle (2) and said pushing member (9) and said pushing bar (10) cause said fastener supply gear wheel (3) to rotate by one increment; and

(m) spring means for returning said manually manipulatable lever means (14, 15), said hinge portion (6′), said pushing member (9), and said pushing bar (10) to their original

positions upon release of said manually manipulatable lever means (14, 15).

4,482,089

METHOD OF LINING A FLUID CONNECTION OPENING IN A FRAME PLATE OF A PLATE HEAT EXCHANGER

Lars Lindahl, Handen, and Bengt Carlsson, Vargön, both of Sweden, assignors to Reheat AB, Taby, Sweden

Filed Oct. 18, 1982, Ser. No. 434,923
Int. Cl.³ B23K 31/02
U.S. Cl. 228—173 C 6 Claims

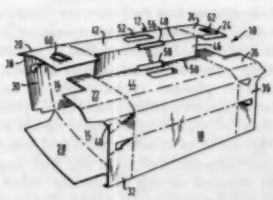
1. A method of lining a connection opening for fluid in a frame plate of a plate heat exchanger, characterized in that said frame plate has an inside surface, an outside surface and an undepressed area about the connection opening on each side surface of the plate, in that a pipe socket with a diameter corresponding to the diameter of the opening is provided with a flange of thin sheet metal, with a thickness of at maximum 1 mm, and is placed in the opening with the flar ge abutting the undepressed area about the opening on the inside surface of the plate with a socket portion projecting on the outside of the plate, and in that said socket portion is provided with a flange to abut the undepressed area about the opening on said outside surface of the plate.

4,482,090

PACKAGE SLEEVE WITH GUSSET PANEL FOR TIGHTENING SLEEVE AND REINFORCING A HANDLE

Andre Milliens, Etrechet, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 3, 1983, Ser. No. 463,463
Claims priority, application United Kingdom, Jan. 27, 1982, 8202361
Int. Cl.³ B65D 5/46, 5/02
U.S. Cl. 229—40 4 Claims



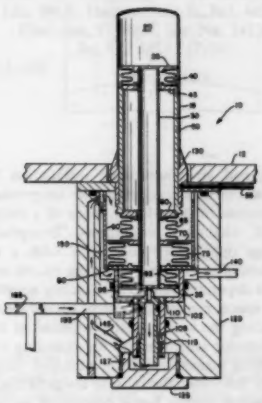
1. A sleeve (10) for forming a packaging case, which sleeve is formed from paperboard or similar sheet material and includes end closure panels (20, 22, 28, 30, 32; 24, 26) at each of its opposite ends, the sleeve including means whereby its circumference can be reduced so as to tighten said sleeve about a group of articles accommodated therein, said means comprising a gusset panel (46) interconnecting and hinged to adjacent panel portions (42, 44) forming a top panel (12) of the sleeve, said gusset panel (46) being foldable about its hinged connections (48, 50) from a first position in which it lies intermediate of and in substantially the same plane as said adjacent portions of the top panel into a second position in which said adjacent portions of the top panel are in overlapping relationship with said gusset panel disposed therebetween, and first hand gripping apertures (52, 54) disposed in said top panel portions (42, 44) adjacent to said hinged connections with said gusset panel (46), and second hand gripping apertures (56, 58) positioned at said hinged connection of said gusset panel and aligned with said first hand gripping apertures so that said first and second hand gripping apertures (52, 54; 56, 58) are brought in registry with one another when said gusset panel is folded into said second position.

4,482,091

TEMPERATURE SENSOR

Joseph W. Lawsing, Windsor Locks, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,200
Int. Cl.³ G05D 27/00
U.S. Cl. 236—92 R 8 Claims



1. A temperature sensor characterized by:

a probe adapted for placement at a location the temperature of which is to be measured, said probe containing a reservoir of a first fluid and a first bellows responsive to the pressure of said first fluid; and

a chamber portion thermally isolated from said probe and including therein:

a valve comprising a first movable header connected to said first bellows and a stationary nozzle,

means connecting said valve to said first bellows for operation thereby:

a first conduit for channeling a second fluid through said valve, adjustments in the setting of said valve by said first bellows effecting corresponding adjustments in the pressure of said second fluid indicative of variations in said measured temperature;

a jacket in fluid communication with said valve, flow of said second fluid through said jacket maintaining said connecting means at a uniform temperature for minimization of differential expansion thereof and insulation thereof from variations in ambient temperature;

said chamber portion including a second fluid conduit providing fluid communication between said nozzle at an outlet thereof and said jacket; and

a second movable header fixed to said connecting means, said second header being in fluid communication with said second fluid conduit, said second fluid conduit channeling said second fluid to said second header for pressurization

thereof in a direction opposite that of the pressurization of said first header.

4,482,092

HEATING AND AIR-CONDITIONING INSTALLATION FOR MOTOR VEHICLES

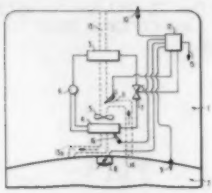
Wolfgang Biber, Eutingen im Gäu; Werner Stähle, Sindelfingen, and Albert Stolz, Tuebingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 22, 1982, Ser. No. 435,962

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142643

Int. Cl.³ G05D *23/00*

U.S. Cl. 237—12.3 B **20 Claims**



1. A heating and air-conditioning installation for motor vehicles, by means of which an adjustable temperature is kept substantially constant in the interior space of a motor vehicle independent of changing conditions, comprising heat-exchanger means operatively connected with a hot water circulatory system of the engine, adjusting means on the position of which is dependent the heat quantity supplied to the vehicle interior space, electronic control circuit means, sensor means for detecting the heat quantity supplied to the vehicle interior space, interior sensor means for detecting the interior temperature, setting means for setting a desired value, outside sensor means for detecting the outside temperature, the position of the adjusting means being controlled by way of an output signal produced by said electronic circuit means as a function of the sensor means sensing the heat quantity supplied to the vehicle interior space, the interior sensor means, the setting means and the outside sensor means, and switching means for switching from fresh-air operation to recirculated-air operation controlled in dependence on a signal of the electronic circuit means, the electronic circuit means including means for forming a signal in dependence on the difference between the value detected by the outside sensor means and the value predetermined at the setting means, the switching from fresh-air operation to recirculated-air operation taking place as a function of said signal.

4,482,093

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Martin Hafner, Leonberg; Karl Hofmann, Remseck; Josef Schlagenhauf, Esslingen; Gerhard Stumpp, Stuttgart, and Dietrich Trachte, Kornwestheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 8, 1982, Ser. No. 386,377

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125884

Int. Cl.³ F02M *47/00*

U.S. Cl. 239—73 **16 Claims**

1. A fuel injection nozzle for internal combustion engines, comprising;

a nozzle holder having a chamber;

a nozzle body tensioned against the nozzle holder, and defining a nozzle opening;

a tensioned spacer plate location between the nozzle body and the nozzle opening;

a locking spring located in the nozzle body chamber;

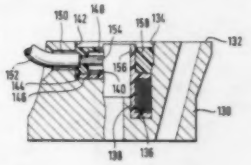
a valve needle disposed in the nozzle body and loaded by the locking spring toward the nozzle opening;

an induction coil mounted in the tension spacer plate;

two laterally disposed contact prongs connected to the induction coil;

securing means electrically connecting one end of a pair of connecting wires extending through the nozzle holder one each to a respective one of the contact prongs disposedly connected to said induction coil;

said nozzle holder defines an aperture rim of the chamber



and includes a lead-through borehole for each connecting wire, said spacer plate includes clearance spaces and interconnected channels, the channels extending from a respective clearance space to the junction point of a contact prong and connecting wire, said respective clearance space and channel together extending around the aperture rim, and respective clearance spaces and channels communicate with a respective lead-through borehole;

said junction points for the connecting wires and their respective contact prong are located on the side of the contact prong opposite to and turned away from the nozzle body; and

said junction points of the contact prongs are embedded in the facing surface of the spacer plate, and the junction points of the contact prongs are fused to respective connecting wires.

4,482,094

ELECTROMAGNETIC UNIT FUEL INJECTOR

Richard S. Knape, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

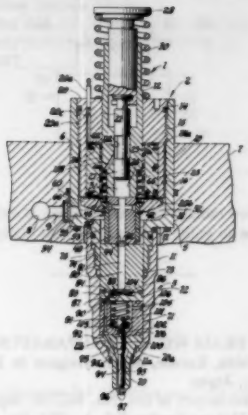
Filed Sep. 6, 1983, Ser. No. 529,220

Int. Cl.³ F02M *47/00*

U.S. Cl. 239—88 **3 Claims**

1. An electromagnetic unit fuel injector comprising a housing means having a fuel passage means connectable to a source of fuel for the ingress and egress of fuel at a suitable supply pressure; a pump cylinder means in said housing means; an externally actuated plunger reciprocable in said cylinder means to define therewith a pump chamber; a cylindrical valve seat member fixed to said pump cylinder means at said pump chamber end thereof so as to define with said housing means a fuel chamber in communication with said fuel passage means, said valve seat member having an annular valve seat on its outer peripheral surface next adjacent to said pump cylinder means and an annular groove adjacent to said valve seat, an axial passage therethrough in communication at one end with said pump chamber and, at least one radial port positioned to effect flow between said axial passage and said annular groove; said housing means including a valve body having a spray outlet at one end thereof for the discharge of fuel; an injection valve means movable in said valve body to control flow to said spray outlet; a discharge passage means effecting flow communication between said spray outlet and the opposite end of said axial passage; a tubular valve with an annular valve seat surface thereon encircling said valve seat member for axial move-

ment between a valve open position and a valved closed position relative to said valve seat whereby to control flow between said fuel chamber and said annular groove; and, a solenoid means operatively positioned in said housing means, said



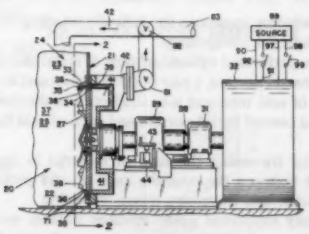
solenoid means including a pole piece encircling said pump cylinder means, an armature disc fixed to said tubular valve for movement therewith and, a spring means operatively associated with said tubular valve to normally bias it to said open position.

4,482,095

BI-DIRECTIONAL ROTOR AND STATOR IN A VORTICAL CIRCULATION PULPER

Donald W. Danforth, Andover, Mass., assignor to Bolton-Emerson, Inc., Lawrence, Mass.

Filed Sep. 23, 1982, Ser. No. 422,342
Int. Cl.³ B02C *23/36*
U.S. Cl. 241—46.11 **5 Claims**



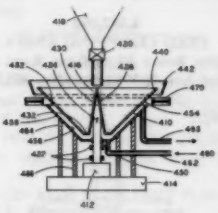
1. A vortical circulation pulper comprising:
a stock container having a bottom wall and a side wall;
a bladed and channeled stator in one of said walls and a vaned, vortical-circulation rotor, rotatable within said stator to vortically circulate stock in said container;
said stator having a truncated conical, bladed and channeled underface, a smaller open end facing into said container and a larger open end facing away from said container;
said stator being bi-directional and shaped in an annular, symmetrical, pattern of alternate triangular, peaks and valleys, each peak having a pair of stock reduction, acquisition edges, each on an opposite side thereof;
vortical circulation vanes on said rotor, said vanes being bi-directional and shaped in an annular, symmetrical pattern of alternate peaks and valleys, each peak having a pair of outer stock reduction bladed edges thereon, each on an opposite side thereof, and each extending from an outer tip to a high point thereon said edges jointly outlining a truncated conical, bladed outer face;
the truncated conical, bladed and channeled underface of said stator and the truncated conical bladed outer face of said rotor forming a truncated-conical stock reduction interface;
said stator valleys constituting acquisition spaces, for receiving large chunks of said stock;
and the outer, stock reduction bladed edges of said rotor vanes cooperating with the stock reduction acquisition edges of the peaks of said stator at a predetermined acquisition angle to successively impart a scissors-like impact to said chunks received in said acquisition spaces to progressively reduce the size thereof for entering said stock reduction interface when said rotor is rotated clockwise or counter clockwise; and
means for selectively rotating said rotor within said stator in a clockwise direction or in a counter clockwise direction.

4,482,096

APPARATUS FOR PRODUCING CEMENTITIOUS PRODUCT FROM QUENCHED FLY ASH

Ping-Wad Lin, 506 S. Darling, Angola, Ind. 46703

Filed Jan. 21, 1982, Ser. No. 341,491
Int. Cl.³ B02C *17/04*
U.S. Cl. 241—65 **7 Claims**



1. An apparatus for producing finely divided and fractured particulate material comprising one of fly ash, calcium oxide coated with calcium sulfate, or calcium oxide coated with calcium carbonate, comprising means for controllably discharging heated particulate material, a conical container having a constant slope conical surface and for receiving the discharged heated particulate material while it is still at an elevated temperature, said surface being a high heat conductive surface, means for cooling the conical surface of said container, means for rotating said conical container whereby the particles of said heated particulate material are caused to roll upwardly along the conical surface and thereby maximizing particle surface contact with the conical surface to rapidly quench by conduction the heated and rolling particles as the particles move under the influence of centrifugal force and emerge at the outer upper periphery of said conical container, and means for collecting the quenched material as it emerges from the upper periphery of said container and is collected in finely divided fractured form as rapidly quenched particles.

4,482,097

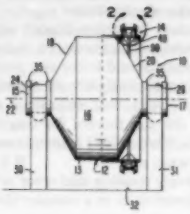
ROTARY APPARATUS HAVING IMPROVED DRIVE MEANS

Alan M. Stone, Greensborough, Australia, assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Aug. 2, 1982, Ser. No. 404,023
Claims priority, application Australia, Aug. 17, 1981, PF0275
Int. Cl.³ B02C *17/24*
U.S. Cl. 241—101.2 **30 Claims**

1. In combination: a rotary apparatus having a pair of spaced ends, a central axis through said ends, and means coupled

thereto for mounting the ends of the apparatus on a fixed support for rotation about said central axis relative to said support; a wrap-around electric motor coupled with the apparatus and axially spaced from the mounting means for rotating the apparatus, the motor including an annular rotor secured to and surrounding the apparatus for rotation therewith and an



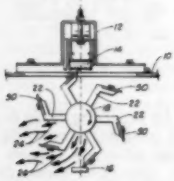
annular stator surrounding the rotor and being spaced from the rotor to have a gap therebetween; anti-friction bearing means extending about the apparatus for mounting the stator on the apparatus adjacent to and surrounding the rotor; and means coupled to the stator for coupling the stator to said support to prevent rotation of the stator relative to the rotor as the rotor rotates with the apparatus relative to the support.

4,482,098

FEED CHOPPING KNIFE

Charles J. Murphy, Route #1, Abilene, Kans. 67410

Filed Apr. 5, 1982, Ser. No. 365,370
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—292.1 **6 Claims**



1. An improved feed chopping knife for mounting on a rotating feed chopping cutter head and engaging a cutter bar, the knife comprising:

an elongated metal bar having a front surface, a rear surface, side surface and a beveled cutting edge along the length thereof, the cutting edge beveled upwardly from the rear surface of the bar to the front surface of the bar; and

a groove cut in the leading edge and in the front surface of the bar and along the length thereof, the groove reducing the surface area of the beveled cutting edge normally contacting the cutter bar.

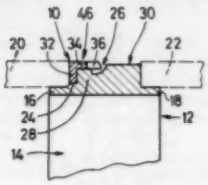
4,482,099

THREAD CATCHER RING

Heinz Oswald, and Walter Vetterli, both of Winterthur, Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Jun. 3, 1983, Ser. No. 500,873
Int. Cl.³ B65H *75/32, 75/28*
U.S. Cl. 242—19 **11 Claims**

1. A thread catching and severing ring structure for use on a chuck of a filament winding machine comprising at least one axially directed projection having an underside facing radially inwardly and a thread guiding and severing edge, a clamp member secured in engagement with said underside of said projection to form a thread clamp therebetween and a guide surface sloping radially inwardly towards and under said projection and then radially outwardly towards said underside of said projection to guide a thread into said clamp.

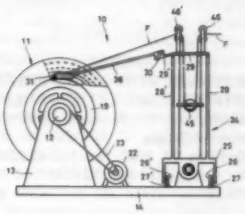


4,482,100

BEAM WINDING APPARATUS

Yorikazu Yoshida, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 302,730, Sep. 16, 1981, abandoned. This application Feb. 3, 1984, Ser. No. 576,943
Claims priority, application Japan, Sep. 27, 1980, 55-133695
Int. Cl.³ B65H *75/00, 54/28*
U.S. Cl. 242—55 **6 Claims**



1. A beam winding apparatus for helically winding an elongate strip of material, comprising:

(a) a rotative perforated cylindrical tube of metal and having a central barrel portion, a pair of flanges disposed at opposite ends of said tube and a conical portion disposed between said central barrel portion and each of said flanges, and

(b) means for traversing the strip of material in opposite directions between the opposite ends of said perforated metallic tube, said traversing means including

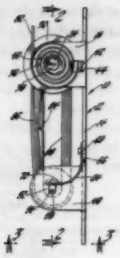
(1) a pivotally supported guide member slidably movable over the layers of strip that have been wound on said tube, said guide member including a frame portion receiving the strip of material, an electrically insulative plastic portion slidingly engageable with the layers of strip, and a metallic portion sandwiched between said frame and plastic portions in vertical alignment therewith and having a width substantially the same as the width of the strip, said metallic portion including opposite sections engageable with said conical portions of said metallic tube to define therewith an electrical switch, and

(2) electric-power-driven actuation means electrically connected with said guide member and responsive to said electrical switch for actuating reversal of the traversing direction of winding the strip upon engagement of each of said opposite sections of said metallic portion with a corresponding one of said conical portions of said metallic tube.

4,482,101
SEAT BELT RETRACTOR

John J. Bart, Jr., Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 13, 1983, Ser. No. 503,826
Int. Cl.[3] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107 3 Claims

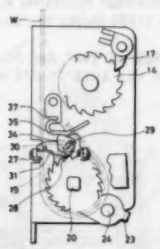


1. A storage retractor for storing a seat belt comprising:
a housing;
first and second spindles rotatably mounted on the housing in spaced apart parallel relation;
the belt having an end circumscribing the first and second spindles and attached to itself to form a loop; and
a spring acting between one of the spindles and the housing and adapted to rotate the one spindle so that the loop of belt orbits the first and second spindles and winds the belt in successive layers atop the loop and around the first and second spindles.

4,482,102
WEBBING-LOCK MECHANISM SUITABLE FOR USE IN VEHICLE SEAT BELT

Yasumasa Sano, Fujisawa, Japan, assignor to NSK-Warner K.K., Japan

Filed Nov. 30, 1982, Ser. No. 445,454
Claims priority, application Japan, Dec. 11, 1981, 56-184406[U]
Int. Cl.[3] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.2 3 Claims

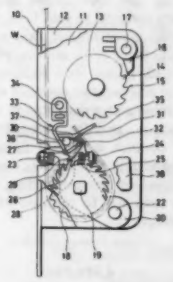


1. A mechanism suitable for use in a vehicle seat belt to restrain movement of a webbing paid out from a take-up reel, said mechanism comprising:
(a) a base;
(b) a support lever supported swingably on the base;
(c) a guide roller supported rotatably on the support lever, with the webbing extending over a predetermined length of the guide roller circumference;
(d) a ratchet gear rotatable integrally with the guide roller and defining acute teeth;
(e) a ratchet lever mounted on the support lever for movement between an engagement position where the ratchet lever is in complete engagement with the ratchet gear, an intermediate position where the ratchet lever is engageable with the ratchet gear and a non-engagement position where the ratchet lever is out of engagement with the ratchet gear, the ratchet lever having an acute tooth which is engageable with the teeth of the ratchet gear;
(f) a pawl provided as an integral member with the ratchet lever and displaceable in the support lever between a first position where the pawl is in engagement with the guide roller so as to inhibit any rotation of the guide roller and a second position where the pawl is out of engagement with the guide roller so as to permit free rotation of the guide roller; and
(g) guide means mounted on the base and, when the support lever turns, engageable with the ratchet lever so as to guide the ratchet lever from the non-engagement position to the intermediate position;
whereby the ratchet lever is guided by said guide means from the non-engagement position to the intermediate position when a tensile force of at least a predetermined value is applied to the webbing to move the guide roller and swing the support lever, the tensile force on the webbing then causing the ratchet lever to move from the intermediate position to the engagement position and causing the pawl, which is integral with the ratchet lever, to move from the second position to the first position due to the displacement of the ratchet lever from the non-engagement position to the engagement position when the guide roller has been moved further by the tensile force applied to the webbing.

4,482,103
WEBBING-LOCKING MECHANISM

Yasumasa Sano, and Osamu Kawai, both of Fujisawa, Japan, assignors to NSK-Warner K.K., Japan

Filed Nov. 30, 1982, Ser. No. 445,455
Claims priority, application Japan, Dec. 11, 1981, 56-184405[U]
Int. Cl.[3] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.2 12 Claims



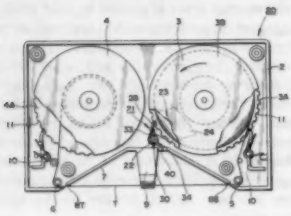
1. A webbing-locking mechanism including a rotatable guide roller allowing a webbing, which is fastened at one end thereof to a take-up reel, to extend over a predetermined length of the circumference of the guide roller, said mechanism comprising:
a locking member and means for mounting the locking member for movement between a first position to permit free rotation of the guide roller and a second position to inhibit any rotation of the guide roller; and
guide means for guiding the locking member from the first position to the second position when a tensile force of a predetermined value or greater has been applied to the webbing and from the second position to the first position when the tensile force has been released, means for mounting the guide roller for displacement relative to the guide means, said locking member being displaceable by the guide means when the guide roller is displaced relative to the guide means, wherein the said guide means is provided

with a first guide portion to guide the locking member from the first position to the second position when the guide roller has been displaced by the tensile force applied to the webbing and a second portion to guide the locking member from the second position to the first position when the tensile force has been released.

4,482,104
TAPE CASSETTE

Kenzo Saito, Izumi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,127
Claims priority, application Japan, May 6, 1981, 56-66827
Int. Cl.³ G11B *15/32, 23/04*
U.S. Cl. 242—198 **6 Claims**



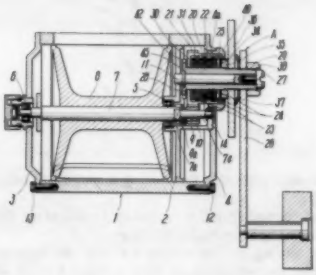
1. A tape cassette comprising:
a rotatable supply reel having flange means;
a rotatable take-up reel; and
said supply and take-up reels being mounted for rotation in either one or two opposed directions;
a tape wound on said supply and take-up reels and extending between said reels;
lock means for preventing rotation of said supply reel in a first of said directions to rewind said tape on said supply reel;
means for moving said lock means including pivot means and plate means secured to said lock means and pivotally mounted on said pivot means, said plate means being in frictional engagement with said supply reel for pivotally moving said lock means into locking contact with said flange means in response to rotation of said supply reel in said first direction to prevent rotation of said supply reel in said first direction, and for pivotally moving said lock means out of contact with said flange means to permit rotation of said supply reel in a second direction opposite to said first direction for unwinding said tape from said supply reel in response to rotation of said supply reel in said second direction.

4,482,105
FISHING REEL

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 229,268, Jan. 28, 1981, abandoned. This application Nov. 30, 1982, Ser. No. 445,508
Claims priority, application Japan, Jan. 31, 1980, 55-12221
Int. Cl.³ A01K *89/02*
U.S. Cl. 242—212 **8 Claims**

2. A fishing reel comprising: a frame having first and second side plates opposite to each other at a predetermined interval and an outer plate positioned outwardly of said first side plate; a spool shaft journalled to said side plates at said frame and having an extending shaft portion disposed between said first side plate and said outer plate; a spool disposed between said side plates and rotatable together with said spool shaft; a pinion shaft having a pinion, being positioned on said extending shaft portion at said spool shaft, and being slidable between a position where said pinion shaft engages with a portion of said spool shaft to thereby rotate therewith and a position where said pinion shaft disengages from said portion of said spool shaft to allow said spool shaft to rotate relative to said pinion shaft; a support shaft fixed to said first side plate and extending through an insertion bore in said outer plate to extend axially outwardly therefrom; a drive mechanism supported to said support shaft for driving said pinion shaft, said drive mechanism comprising a tubular shaft supported rotatably to said support shaft, a cylinder which is supported rotatably to said tubular shaft, having at the outer periphery therof a main gear in mesh with said pinion, extending at the axially outer end through said insertion bore and outer plate so as to project beyond the outermost extent of said outer plate, and provided

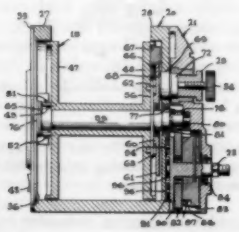


at the axially inner side with an end plate having a central bore, the largest diameter of said cylinder being smaller than the diameter of said insertion bore to permit said cylinder to pass freely through said insertion bore; a drag mechanism having a plurality of friction plates housed within said cylinder; and a handle supported to said tubular shaft, said support shaft engaging with a single removable fixation member which is the sole mechanism for preventing said drive mechanism from moving axially outwardly with respect to said cover plate and support shaft, said drive mechanism being freely removable from said frame without removing said outer plate therefrom upon removal of said single fixation member.

4,482,106
GEARED FISHING REEL

Oscar Kovalovsky, 11154 Debby St., North Hollywood, Calif. 91606

Filed Sep. 28, 1982, Ser. No. 424,869
Int. Cl.³ A01K *89/015, 89/02*
U.S. Cl. 242—220 **8 Claims**



1. In a geared fishing reel having a spool rotatably carried on a frame for storing a length of fishing line, the combination comprising:
a winding means for driving said spool rotatably on said frame including a crank plate having a large diameter portion and a smaller diameter portion and an outwardly

extending turning crank and knob and a drive gear rotatably carried with respect to said frame;

drag means carried on said frame for selective applied tensional engagement with said spool;

direct drive means cooperatively carried between said crank plate and said drive gear for non-slip, positive drive of said spool under control by said winding means and including a single lug laterally carried on said drive gear over the periphery of said crank plate smaller diameter portion;

a resiliently mounted latch disposed on said large diameter portion of said crank plate normally biased into abutting engagement with said drive gear lug as said crank plate is rotated in a winding direction;

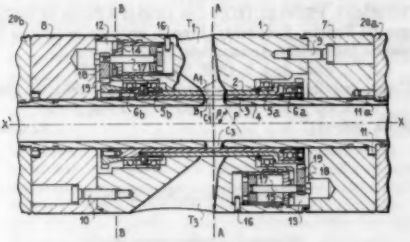
disconnect means operably carried on said frame between said drive gear and said crank plate for disabling said direct drive means whereby said spool and said drive gear rotate to the exclusion of rotation of said winding means against the applied tension of said drag means.

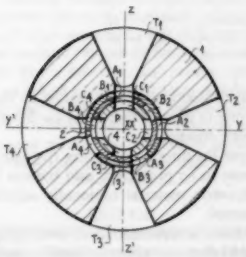
4,482,107

CONTROL DEVICE USING GAS JETS FOR A GUIDED MISSILE

Pierre Metz, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Jun. 28, 1982, Ser. No. 392,614
Claims priority, application France, Jun. 30, 1981, 81 12835
Int. Cl.³ F42B *15/18*
U.S. Cl. 244—3.22 **8 Claims**





1. A gas control device for steering guided missiles, comprising:

an annular nozzle holder member having four equally spaced nozzles;

first and second sleeve means coaxially arranged inside said annular member with each of said first and second sleeves having four spaced gas passages which are not equally spaced; and

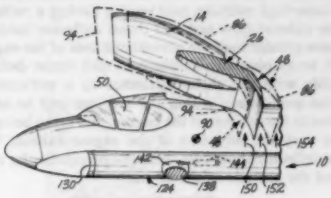
positioning means having two stable states in order to divert a gas flow towards one of said four nozzles.

4,482,108

TILT WING SHORT TAKEOFF AIRCRAFT AND METHOD

Richard C. Sutton, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US82/01357, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982, PCT Pub. No. WO84/01341, PCT Pub. Date Apr. 12, 1984
PCT Filed Sep. 29, 1982, Ser. No. 451,654
Int. Cl.³ B64C *15/12, 29/00, 15/14, 3/38*
U.S. Cl. 244—12.4 **10 Claims**



1. A short takeoff and short landing aircraft or vertical/short takeoff and vertical short landing aircraft, comprising:

variable incidence wings, one on each side of the aircraft;

at least one primary jet engine on each wing, each engine being positioned for upper surface blowing of the jet exhaust over the top of the wing;

each engine having a nacelle fixed in a respective wing adapted to be tilted with the wing when its incidence is varied;

incidence varying means in the aircraft adjacent each wing for respectively tilting each wing and its engine for takeoff and landing;

flaps on said wings over which the engines exhaust and means in said wings to deflect said flaps for takeoff and landing; and

translation means in the aircraft adjacent each wing for respectively translating each wing to provide center of gravity trim and engine out moment trim;

said tilting of the wings and engine being from a generally horizontal cruise position to a thrust restored position.

4,482,109

JET AIRCRAFT

Anthony A. duPont, 2300 Via Pacheco, Palos Verdes Estates, Calif. 90274

Filed Jun. 4, 1981, Ser. No. 270,578
Int. Cl.³ B64C *15/02, 29/00*
U.S. Cl. 244—12.5 **5 Claims**

1. An aircraft comprising: a fuselage, wing and tail assembly contoured to provide a smooth variation in cross-sectional area from the nose of the fuselage to the tail in accordance with the area rule, so that the fuselage approaches the shape of lowest drag at the cruising speed of the aircraft, the wing having a swept-back configuration with its forward edge extending outwardly and rearwardly from the nose of the fuselage on each side of the fuselage and exhibiting high lift at low speeds of the aircraft and low drag at the cruising speed of the aircraft; at least one jet engine positioned in the nose of the fuselage

without bulging the contour of the aircraft so as to provide compliance with the area rule, the inlet of the engine being positioned in the nose of the fuselage and the exhaust of the engine exiting underneath the fuselage so that the thrust of the engine may be deflected for take-off and landing; a thrust deflector pivotally mounted to the underside of said fuselage and turnable between a retracted position completely within the confines of the fuselage displaced from the exhaust of said engine during normal cruising speeds of the aircraft, and an inclined position within the exhaust of the engine so as to deflect the exhaust through controllable angles to approximately 75° to permit the aircraft to take off and land vertically with nose-high attitude, said enging having a rectangular exit for the exhaust flow and said thrust deflector having a nozzle exit area greater than the normal exit area of the engine, and an airfoil array pivotally mounted to said thrust deflector to be movable with the thrust deflector to a retractable stowed position completely within the fuselage and to an operating position in the exhaust of the engine, said array being controllable to vary the direction of the engine exhaust leaving the thrust deflector about two mutually perpendicular axes so as to control the attitude of the aircraft.

4,482,110

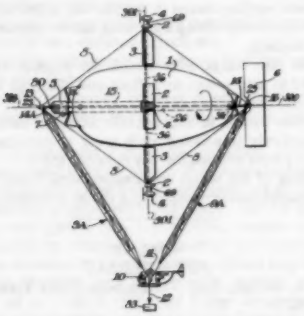
CYCLOROTOR COMPOSITE AIRCRAFT

Arthur G. Crimmins, Jr., Bozman, Md., assignor to International Cyclo-Crane Licensing, A Virginia Partnership, Bozman, Md.

Continuation-in-part of Ser. No. 910,186, May 30, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 207,076

Int. Cl.³ B64B *1/32*

U.S. Cl. 244—26 **10 Claims**



1. A hybrid aircraft comprising in combination a lighter-than-air gas-containment envelope, a structure comprising wing airfoils, blade airfoils, thrust means, linkage means and control means operatively connected characterized as follows:

(a) a gas-containment envelope for lighter-than-air gas providing bouyant lift comprising an impermeable surface capable of retaining said gas with adequate strength to accept pressure and other leads thereon, said gas-containment envelope containing a volume of gas with structure means for transferring the bouyant lift of said gas to said structure and capable of providing lift to said structure;

(b) a support structure consisting of horizontal members and radial members, operatively connected, said radial members being mounted on the horizontal members in a plane ninety degrees to said horizontal members, said horizontal members being operatively attached to the gas-containment envelope whereby the aerostatic lift of the gas contained within the gas-containment envelope is transferred to the horizontal members;

(c) said wing airfoils being mounted by bearing and actuation means on the radial member whereby the wing airfoils span-wise axes may be oriented parallel to the horizontal members of the aircraft or whereby said wing airfoils may be rotated to position said span-wise axis of said wing airfoils in a plane at ninety degrees to the horizontal members and whereby the angle of attack of said wing airfoils may be adjusted to vary lift;

(d) said blade airfoils being mounted by bearing and actuation means on the radial members with the blade airfoils span-wise axes in a plane at ninety degrees to the horizontal members and whereby said blade airfoils may be rotated to position the blade airfoil chord-wise axes at various angles relative to the radial members;

(e) said thrust means comprising a power source linked to aerodynamic reaction means mounted by bearing and actuation means on the radial members to pivot with said wing airfoils, a thrust means being paired with each wing airfoil and positioned so that the thrust vector from said aerodynamic reaction means is perpendicular to the axis of the radial members and is in a plane normal to said wing airfoil span-wise axes, whereby the direction of the thrust vector may be adjusted to provide rotation of the airfoil structure, specified in (b) to (e), about the horizontal axis of the aircraft and/or movement in the direction of the horizontal axis of the aircraft, and

(f) control means operatively connected with the actuation means specified in (c), (d) and (e) for adjusting said thrust means and airfoils to provide wing cyclic, wing cycloidal, blade cyclic, and blade collective control operatively connected to altitude, attitude, heading and ground relative positions systems linked to a pilot control system.

4,482,111

THERMAL PROTECTION OR DISSIPATION SCREEN

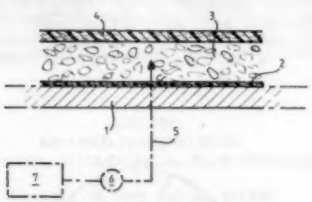
Roger Le Touche, Ecquevilly, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Aug. 5, 1982, Ser. No. 405,653

Claims priority, application France, Aug. 26, 1981, 81 16303

Int. Cl.³ B64C *1/38;* **B64G** *1/58;* **F16L** *59/00*

U.S. Cl. 244—117 A **11 Claims**



1. A thermal dissipation screen applied to the external surface of a substrate to protect said substrate from high temperatures, said screen comprising

a bottom layer for directly covering the exterior surface of the substrate to be protected, said bottom layer comprising a polymeric material optionally reinforced with fibrous material;

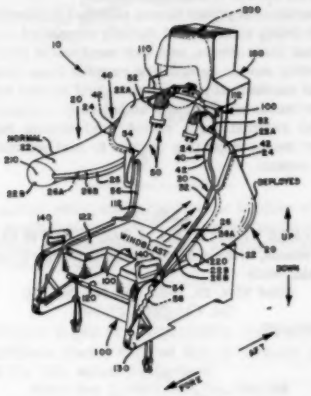
a supple hydrator-overheater layer overlaying said bottom layer, said hydrator-overheater layer comprising a refractory fibrous network, a pulverulent inorganic material capable of absorbing and retaining a liquid to produce a paste or a gel of a high thixotropic efficiency, and a liquid having a vaporization temperature at the pressure of the environment equal to that corresponding to the desired protection temperature of the substrate; and

a flexible upper and exterior layer covering said hydrator-overheater layer, said flexible upper layer comprising a polymeric material which becomes porous at temperatures higher than said vaporization temperature, said upper and exterior layer constituting means permitting said liquid to vaporize at the pressure of the environment.

4,482,112
WINDBLAST ARM PROTECTOR ASSEMBLY

Robert J. Cummings, Hermosa Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 16, 1982, Ser. No. 418,952
Int. Cl.³ B64D *25/02*
U.S. Cl. 244—122 AG **8 Claims**



1. A windblast arm protector assembly for use by an occupant of an open ejection seat of an aircraft, comprising:

a. means, for each arm of said occupant, for accepting, supporting, and restraining said arm while it is in a flexed position adjacent occupant's side during ejection of said seat and of said occupant together from said aircraft, wherein said means include a full length sleeve member independent of any garment body, with said sleeve member shaped and dimensioned from the shoulder area to its wrist area in the form of a flexed arm and has a shoulder opening and a wrist opening therein, a first loop member disposed around, and attached to the inside perimeter of said shoulder opening, a second loop member having a first portion extending internally of said sleeve member from said shoulder opening to said wrist opening and attached to the inner surface of said sleeve member near said wrist opening, wherein said second loop member has a second portion extending externally of said sleeve member from said wrist opening to said shoulder opening, with said second portion releasably attached to the outer surface of said sleeve member, and means, operably associated with said first and second loop members, for interconnecting said first and second loop members; and

b. means, operably connected to said ejection seat and to said arm restraining means, for releasably securing said arm restraining means to said ejection seat.

4,482,113
INTEGRATED PARATROOP DOOR

John G. Backlund, Huntington Beach, and David L. Gibler, Rancho Palos Verdes, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 336,473, Dec. 31, 1981, abandoned. This application Mar. 13, 1984, Ser. No. 586,893
Int. Cl.³ B64C *1/24, 1/14*
U.S. Cl. 244—129.5 **2 Claims**

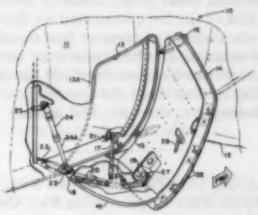
1. A door structure, especially suited for providing ingress or egress to or from the body structure of a vehicle, which comprises:

a. a door frame defining a door opening in said body structure;

b. a door, configured to be received by said door frame, and hingedly mounted near said frame for outward swinging movement relative to said door opening and vehicle;

c. a platform pivotally mounted within said body structure near said door frame for outward pivotal movement between stored and operative positions, in response to outward swinging movement of said door;

d. a substantially rigid el-shaped connecting member, pivotally interconnecting said platform and door, for substantially simultaneous pivotal movement of said platform with said swinging movement of said door, said member connected at one end to said platform for simultaneous



rotation and pivoting about the place of connection to said platform, and at the other end to said door for simultaneous rotation and pivoting about the place of connection to said door;

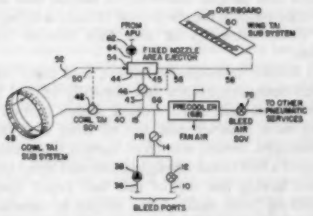
e. said connecting member including an over center link interconnecting said pltform and door whereby said link releasably locks said platform and door in said operative position; and

f. a pressure operated cylinder for controlling said pivotal movement of said platform and said swinging movement of said door.

4,482,114
INTEGRATED THERMAL ANTI-ICING AND ENVIRONMENTAL CONTROL SYSTEM

Alankar Gupta, Renton, and Kenneth L. Waters, Federal Way, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 228,878, Jan. 26, 1981, abandoned. This application Jul. 5, 1983, Ser. No. 510,739
Int. Cl.³ B64D *15/02*
U.S. Cl. 244—134 B **37 Claims**



1. A pneumatic service system aboard an airplane, comprising:

a source of hot compressed air;

a first region requiring heat for combating ice formation including a flow through heat exchanger means having an inlet and an outlet;

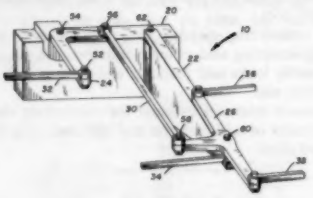
a second region requiring temperature conditioned compressed air;

an air mixing station;

first duct means delivering a first portion of the hot compressed air to the inlet of said heat exchanger means;

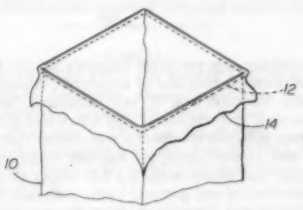
second duct means delivering a second portion of the hot compressed air to the air mixing station;
third duct means delivering air from the outlet of the heat exchanger means to the air mixing station;
fourth duct means delivering mixed air from the air mixing station to said second region;
wherein the first region requiring heat for combating ice formation is an engine inlet cowl having cowl wall means defining the leading edge portions of the inlet cowl and an internal wall defining with said cowl wall means an annular chamber inside the cowl;
said heat exchanger means comprising circumferential tube means situated inside of said chamber through which the first portion of the hot compressed air flows; and
means for circulating low pressure heat transfer air through the cowl chamber, said heat transfer air having a pressure that is lower than the pressure of said hot compressed air, for picking up heat from the first heat exchanger means and delivering it to the cowl wall means.

4,482,115
FLIGHT CONTROL MIXING SYSTEM
John Lassiter, Jr., 4461 E. Pikes Peak Ave., Colorado Spring, Colo. 80916
Filed May 4, 1981, Ser. No. 260,115
Int. Cl.³ B64C *13/00*
U.S. Cl. 244—220 **24 Claims**



1. A motion control mixing system, comprising:
an object, said object requiring motion control;
and anchor means, said anchor means being removably affixed to said object;
a first motion transmission means, said first motion transmission means being removably and pivotally affixed to said anchor means;
a second motion transmission means, said second motion transmission means being removably and pivotally affixed to said first motion transmission means, said second motion transmission means pivotal affixation being located at the distal extremity of said first motion transmission means;
a third motion transmission means, said third transmission means being removably and pivotally affixed to said anchor means, said third motion means pivotal affixation being both separate and spaced from said first motion transmission means, said third motion transmission means being of a bell crank configuration, said third transmission means having one leg of said bell crank configuration projecting from said anchor means in substantially the same direction as said first transmission means;
a fourth motion transmission means, said fourth transmission means having a first end and a second end, said first end being removably and pivotally affixed to said third motion transmission means, said second end being removably and pivotally affixed to said second motion transmission means;
a first external force means, said first external force means being removably and pivotally affixed to said third motion transmission means, said first external force means being capable of imparting a motion to said third motion transmission means, said first external force means having said pivotal affixation at the distal end of said leg of said bell crank configured third transmission means projecting from said anchor means;
a second external force means, said second external force means being removably and pivotally affixed to said first motion transmission means, said second external force means being capable of imparting a motion to said first motion transmission means, said second external force means having said pivotal affixation at the distal end of said first motion transmission means;
a first mechanical power means, said first mechanical power means being suitably and directly connected to said first external force means, said first mechanical power means imparting motion to said first external force means; and
a second mechanical power means, said second mechanical power means being suitably and directly connected to said second external force means, said second mechanical power means imparting motion to said second external force means.

4,482,116
ADJUSTABLE PLASTIC FILM BAG MOUTH SUPPORT
Kenneth Vadnais, Livonia, Mich., assignor to New Product, Inc., Southfield, Mich.
Filed Mar. 29, 1982, Ser. No. 363,016
Int. Cl.³ B65B *67/04*
U.S. Cl. 248—99 **3 Claims**

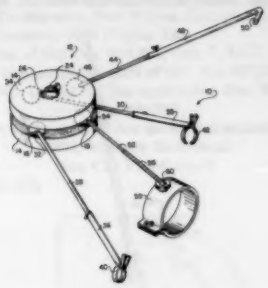


1. A support for retaining the mouth of a plastic film bag open comprising,
a tube having two ends and being partially folded at a plurality of spaced locations, and
means joining said ends of said tube together between two of said spaced locations forming a closed parallelogram having one inflexible length including said joining means and three other flexible lengths,
said support as partially folded being sized to retain a film bag mouth wrapped thereabout substantially open through said support, and
said support being foldable by manually rotating opposed portions of said tube in opposite directions, said flexible lengths tending to bow to more tightly retain said joining means within said ends of said tube.

4,482,117
FEEDING BOTTLE HOLDER
John B. Besek, Jr., 236 D Ave., Coronado, Calif. 92118
Filed Dec. 10, 1981, Ser. No. 329,343
Int. Cl.³ A47D *15/00*
U.S. Cl. 248—103 **9 Claims**

1. A nursing bottle holder for attachment to a baby carriage or the like, said holder comprising:
a central, adjustable clamp defined by a pair of opposed members having a plurality of spherical sockets formed therein;
a pair of downward depending elongated substantial rigid legs, each adjustably secured at its upper end to said connecting member, and each including clip means at its lower end for attaching to a carriage,
and outwardly extending elongated substantially rigid stabi-

lizing rod adjustably secured at one end to said connecting member and including connecting means on the other end for connecting to a carriage, and



an elongated substantially rigid bottle holding arm adjustably secured at one end to said connecting member and including a bottle clamp secured to the other end thereof for securing a bottle.

4,482,118

ADJUSTING BASE FOR GEODETIC INSTRUMENTS

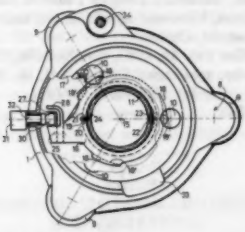
Dieter Hoffmann, Buchs/AG, Fed. Rep. of Germany, assignor to Kern & Co. AG, Aarau, Switzerland

Filed Jun. 2, 1982, Ser. No. 384,389

Claims priority, application Switzerland, Jun. 18, 1981, 4026/81

Int. Cl.³ F16M *3/00*

U.S. Cl. 248—180 **7 Claims**



1. An adjusting base for geodetic instruments with a leveling upper part receiving the instrument, the upper part having a central single socket for receiving an instrument with a corresponding single peg and a set of sockets around the central single socket and a corresponding centering socket for receiving an instrument with a set of corresponding pegs, the upper part comprising a ring with means for manual turning substantially around the axis of the upper part, the ring having a cam profile for clamping the central single peg and a set of blades for clamping the set of pegs.

4,482,119

TABLE TOP ASSEMBLY

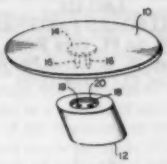
Hyman L. Zelkowitz, Norristown; Jeffrey D. Crawford, Whitehall, both of Pa., and Lucia Mercer, Montpelier, Vt., assignors to Knoll International, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,722

Int. Cl.³ F16M *11/16*

U.S. Cl. 248—188 **6 Claims**

1. A support for a table top positioned upon a pedestal comprising a pin-holding plate adapted to be secured to the underside of said table top, and a plurality of pins secured to and extending downwardly from said pin-holding plate and slidably positioned substantially entirely within corresponding holes in said pedestal, said pins being spaced from the surfaces of said holes with close tolerances therewith to permit free removal of said table top from said pedestal by vertical move-



ment of said table top but to prevent tilting of said table top by engagement of said pins with said surfaces of said holes, said pedestal including sleeves in said holes for slidably receiving said pins, and wherein said sleeves are secured to and extend downwardly from a sleeve-holding plate.

4,482,120

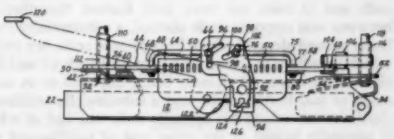
6-WAY MANUAL SEAT ADJUSTER

Chester S. Fudala, Troy, Mich., assignor to Ferro Manufacturing Corporation, Southfield, Mich.

Filed Sep. 20, 1982, Ser. No. 419,938

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—372.1 **5 Claims**



1. Adjustable vehicle seat support structure for a vehicle seat having a seat and seat back comprising an upper elongated generally horizontal seat support, a lower support below said upper support, pivot arms at opposite ends of said supports pivotally connected between said supports and tiltable upon raising or lowering the corresponding end of said upper support, an individually releasable latch for each arm preventing tilting thereof when engaged, each of said arms when latched constituting a substantially stationary pivot for the corresponding end of said upper support to provide for control of tilting of said upper support by force applied to the seat or seat back by the occupant of the vehicle seat, each of said individually releasable latches comprising a rigid latch link pivoted at one end to the corresponding pivot arm, a stationary latch member, means providing for latching engagement between the other end of said latch link and said latch member in a plurality of different positions of said latch link and the pivot arm to which it is pivoted, a selector plate pivotable by an occupant of the seat in opposite directions from an intermediate position in which both of said latches are engaged, actuator links independently movable by said selector plate, means connecting each actuator link to a corresponding latch link and operable to disengage said latch link from said stationary latch member to provide for movement of said latch link by movement of the pivot arm to which it is connected occasioned by movement of the seat by forces applied thereto by its occupant, said selector plate having a pair of elongated openings each having an arcuate idler portion concentric with the pivot axis of said plate, and a connected camming portion inclined to said idler portion, said actuator links having end portions received and slidable in said openings, said end portions of said links being located at the junctions between said idler portions and said inclined camming portions when both of said latches are engaged, said openings being disposed so that upon pivoting of

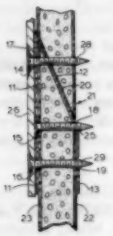
said plate in either direction, the end portion of one of said links moves in the arcuate idler portion while the end portion of the other link is movable along the inclined camming portion to be moved thereby to release the corresponding latch.

4,482,121

WALLBOARD FASTENER

Carl J. Fink, 9675 SW. 1st Pl., Boca Raton, Fla. 33433

Filed Nov. 16, 1979, Ser. No. 95,190
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—489 **9 Claims**



1. A wall fastener for releasable attachment to a wallboard having an angled slot formed therethrough, comprising:

a one-piece, elongated, flat, resilient base plate having a substantially rectilinear first element which has opposite ends and at least one bore hole formed therethrough between said opposite ends thereof, a substantially rectilinear second element which has opposite ends, one end of which is integrally joined to one of said ends of said first element, said second element being disposed at an acute angle to said first element, and a substantially rectilinear third element which has opposite ends, one end of which is integrally joined to the other end of said second element, said third element being disposed at an angle to said second element which is substantially complementary to said acute angle so that said third element is substantially parallel to said first element and at least one of said second and third elements having at least one bore hole extending therethrough aligned with said at least one bore hole of said first element, said second and third elements being insertable in said wallboard slot so that said first element lies substantially flush against the front surface of the wallboard, said second element lies substantially within the slot and said third element lies substantially flush against the rear surface of the wallboard and so that a screw may be threadably received through said bore holes so as to fasten said base plate to said wallboard.

4,482,122

AUTO ANTENNA MOUNTING

Joseph Grashow, Nanuet, N.Y., assignor to Quick-Mount Manufacturing Company, Inc., Brooklyn, N.Y.

Filed Mar. 4, 1983, Ser. No. 472,195
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—514 **8 Claims**

1. In an antenna mount of the ball and socket-type having:

a base, including a socket having a central socket axis, and a support plate, extending from said socket, having a first planar surface portion;

an antenna support receivable in said socket and having a second planar surface portion engageable with said first planar surface portion such that said antenna support may be pivoted in said socket about a pivot axis, said pivot axis being perpendicular to said planar surface portions; and

positive engagement means between said first and said second planar surface portions for locking said antenna support at a selected angle relative to said socket;

the improvement wherein said second planar surface portion is formed by a plurality of projecting teeth annularly disposed about said pivot axis, said teeth defining a plurality of recesses therebetween and wherin said positive engagement means comprises said recesses, and a projection, on said first planar surface portion, extending radially relative to said pivot axis, along the line passing through said axis and parallel to said central socket axis, wherein said projection is adapted to be received in a selected recess.

4,482,123

SUPPORT DEVICE FOR A FIRE EXTINGUISHER

Romain Corbeil, Ste-Rose; Jacques Faubert, Ste-Thérèse, and Marcel Trudeau, Montreal, all of Canada, assignors to Hydro Quebec, Montreal, Canada

Filed Feb. 19, 1982, Ser. No. 350,258
Claims priority, application Canada, Jul. 24, 1981, 382551
Int. Cl.³ A01K *97/10*
U.S. Cl. 248—542 **8 Claims**

1. A device for hanging a fire extinguisher, comprising:

(a) a rigid hook upon which the fire extinguisher can be hung wherein the rigid hook has a groove therein upon which the fire extinguisher can be hung by means of a support ring attached thereto; and

(b) means for preventing access to said hook as soon as the fire extinguisher is removed, so as to prevent the fire extinguisher from being rehung, wherein said means for preventing access to said hook comprises:

a latch having a pair of ends;

means for moving one end of said latch across said groove, thereby closing said groove as soon as the support ring is removed from said groove; and

means for locking said latch as soon as said latch has moved across said groove.

4,482,124
TORSIONAL VIBRATION ISOLATING MOTOR MOUNTING ARRANGEMENT AND METHOD OF MAKING THE SAME

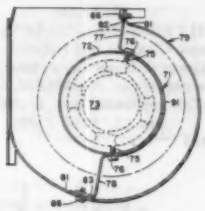
Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 840,263, Oct. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 697,547, Jun. 18, 1978, Pat. No. 4,076,171. This application Jan. 30, 1980, Ser. No. 116,745

The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—604 **8 Claims**



1. In a torsional mode vibration isolating mounting arrangement for an alternating current induction motor designed for excitation by an alternating voltage of a predetermined source frequency, and wherein said motor has a polar moment of inertia Ip, measured in pound-inches-seconds^2, said mounting arrangement including a plurality of arms, formed from sheet material, extending radially from the motor and at least one of which arms has at least one tuning aperture formed therein; said at least one tuning aperture being relatively sized and located so that the cumulative effective spring constant of the mounting arrangement, in pound-inches per radian, will be less than the quantity $2.84 \times Ip \times 10^5$; the improvement wherein: the arrangement includes at least two arms of different effective radial lengths, and wherein said at least two arms have generally equivalent torsional mode flexibility characteristics.

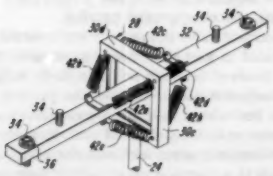
4,482,125
LAMP SUPPORTING UNIT FOR ABSORBING SHOCKS AND VIBRATIONS

Richard Ziernicki, Littleton, Colo., assignor to Over-Lowe Company, Englewood, Colo.

Filed Sep. 22, 1982, Ser. No. 421,590

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—604 **1 Claim**



1. In a portable lighting unit including a mobile unit, a lamp supporting device, comprising:

a pole including a top end and a bottom end adapted to be connected to the mobile unit and having a vertically extending longitudinal axis;

a rectangular-shaped frame including four legs and four corners, the bottom side of one of said legs being connected to said top end of said pole, said remaining three legs positioned vertically above said pole;

an elongated support member, having a longitudinal axis, horizontally positioned through and spaced from said frame so that a portion of said support member is surrounded by but spaced from said frame, said longitudinal axis of said support member being substantially perpendicular to said longitudinal axis of said pole, said support member including means spatially disposed thereon for fastening lamps to said support member; and

a number of springs, the first ends of some of said springs being connected to a top side of said support member and the first ends of the remaining of said number of springs being connected to a bottom side of said support member, said second ends of said springs being connected to the corners of said rectangular-shaped frame to interconnect said frame and said support member, said springs acting to absorb both vertical components and horizontal components of shocks; and

the distance between each of said springs and said means for fastening the lamp being substantially less than the distance between each of said springs and the mobile unit.

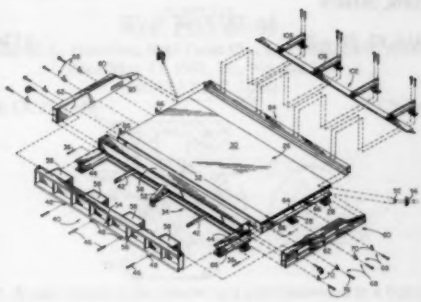
4,482,126
UNIVERSAL MULTI-PART FORM FOR CASTING CONCRETE PARAPETS

Roger L. Toffolon, 953 SE. MacArthur Blvd., Stuart, Fla. 33494

Filed Sep. 23, 1982, Ser. No. 421,963

Int. Cl.³ B28B *7/04*

U.S. Cl. 249—159 **10 Claims**



1. A universal multi-part form for casting concrete parapets, the parapets each having front and rear surfaces and opposite side and end surfaces with the dimensions between end surfaces varying between parapets; the form comprising a stationary base and support means including at least one substantially horizontal upwardly exposed surface for forming one of said front and rear parapet surfaces, a first end surface form member mounted on said stationary base and support means and having an upwardly extending exposed inner surface which at a lower edge portion is contiguous with but in angular relationship relative to said upwardly exposed horizontal surface, a pair of similar but opposite side surface form members mounted on said stationary base and support means and having upwardly extending exposed inner surfaces which at lower edge portions are contiguous with but in angular relationship relative to said upwardly exposed horizontal surface and which at one end portion are respectively contiguous with but in angular relationship relative to said inwardly exposed surface of said first end surface form, each of said side surface form members being supported by said stationary base means for adjustable movement relative thereto in a direction substantially parallel with the upwardly exposed horizontal surface of said base means, and a second end surface form member associated with said stationary base and support means and said side

surface form members at end portions of the latter opposite their said one end portions, said member having an upwardly extending exposed surface which at a lower edge portion is contiguous with but in angular relationship relative to said upwardly exposed horizontal surface of said base means, said inner surface also being contiguous at its opposite end portions respectively with said inner surfaces of said two side surface form members at their said opposite end portions, said second end surface form member being movable relative to said stationary base and support means and said first end surface form member whereby to accommodate parapets of varying dimensions between their opposite end surfaces, and each of said side surface form members being adapted for adjustable movement in a direction substantially parallel with its own exposed inner surface, and releasable securing means provided in association with each of said side surface form members for securing said members in selected positions relative to said stationary base and support means, said selected positions being the same relative to said first end surface form member and substantially different from each other relative to said first end surface form member whereby respectively to provide parapets with parallel end surfaces and parapets with angularly related end surfaces.

4,482,127

VALVE STRUCTURE

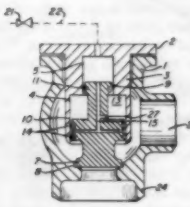
Carl H. Hafele, Bergstrasse 83, 4050 Monchengladbach, Fed. Rep. of Germany

Division of Ser. No. 21,060, Mar. 16, 1979, Pat. No. 4,309,021. This application May 18, 1981, Ser. No. 264,338

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2811879

Int. Cl.³ F16K *31/122*

U.S. Cl. 251—25 **6 Claims**



1. A normally closed on/off valve for use with compressible fluids, actuated by the fluid which it controls, said valve including:

a valve body having a fluid inlet in one sidewall and having aligned openings in opposed end walls, a first of said openings being a fluid outlet;

a valve seat on the inner rim of said first opening;

a one-piece valve cover including an insert extending into said valve body through the second of said aligned openings, said valve insert being spaced apart from the inner walls at the said valve body, said valve insert defining a first wide cylindrical bore extending from its inner end to its central portion, and defining a second narrow cylindrical bore narrower than the said first cylindrical bore and extending from the inner end of said first cylindrical bore toward the outer end of said valve insert;

a valve spool having aligned a first piston, a second piston and a valve closing element, said valve closing element being normally engaged with the said valve seat; said second piston being in said second bore to define therewith a relief chamber; said first piston being in said first bore to define therewith an annular damping chamber, a fluid passageway extending through said valve spool connecting said damping chamber with said relief chamber; relief conduit means extending from said relief chamber through an outer wall of said valve insert; a relief control valve for regulating the flow of fluid through said relief conduit means; said first piston engaging said first bore in such manner that fluid from inside the valve body can leak into said damping chamber; whereby, when the said control valve is normally closed, the said valve element is tightly seated against the said valve seat as a result of the differential fluid pressure applied to the first piston; and, when the said relief control valve is opened, the said valve closing element is displaced from engagement with the said valve seat to permit said compressible fluid to flow from said fluid inlet through said valve body to said fluid outlet.

4,482,128

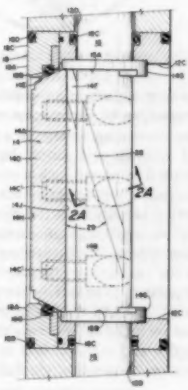
HIGH PRESSURE CAM SEAL VALVE

Paul A. Boeckman, Glenpool, and Dennis L. Young, Tulsa, both of Okla., assignors to Dover Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 494,504, Mar. 11, 1983, Pat. No. 3,627,259. This application Aug. 1, 1983, Ser. No. 519,032

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—163 **6 Claims**



1. A valve comprising:

(a) a body having a flow passageway therethrough defined in part by an annular valve seat and having upper and lower coaxial stem openings therein;

(b) a valve disc assembly positioned in said flow passageway and movable between a closed and an opened position, the valve disc having a forward surface having a peripheral sealing surface and a rearward surface having a body portion attached thereto and having two vertical wall portions, spaced apart and parallel;

(c) a cylindrical valve stem axially and rotatably positionable and sealed in said stem openings in said body, the stem being received between said disc body wall portions;

(d) at a selected position along the portion of said stem which lies within said flow passageway are two cam channels cut in the surface of said stem, one on each side of said stem in contact with said disc body walls, said cam channels in a common plane, which intersects the axis of said stem at a selected acute angle;

(e) two rectangular cam follower ridges adapted to slide in said cam channels, one on each of the surfaces of said walls at said selected acute angle, whereby when said stem is moved axially with respect to said disc assembly, the plane of said disc will move closer to or farther away from the axis of said stem; and

(f) means for axially displacing and rotating said stem whereby said disc may be rotated to an open position

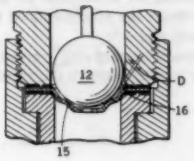
wherein flow is permitted to either side of the disc, and to a closed position wherein flow is blocked.

4,482,129

ALL METAL VALVE STRUCTURE FOR GAS SYSTEMS

Ray W. Baker, Hamilton; Donald A. Pawlak, Centerville, and Alford J. Ramey, Miamisburg, all of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1982, Ser. No. 387,114
Int. Cl.³ F16K *1/14, 1/42*
U.S. Cl. 251—334 **6 Claims**



1. A valve structure comprising:
- a valve housing having an upper portion of first diameter aligned with and connected directly to a lower portion of second diameter;
- a ball valve element moveable within said housing and having a diameter less than the first diameter and greater than the second diameter;
- a resilient corrugated metal ring having an outer flange forming a gas-tight seal with said valve housing at the connection of said upper and lower portions, said ring having;
- an outer annular ridge having a diameter less than the diameter of said valve element for limiting the motion of said element and thereby preventing nonelastic deformation of said ring;
- an inner annular ridge for providing a gas-tight seal with said element;
- a central opening adjacent to said inner ridge forming a valve port; and
- an annular groove connecting said outer ridge and said inner ridge for flexing and for providing seating pressure when said inner ridge is in sealing contact with said element;
- said ring contacting said valve housing only between said outer diameter and said outer annular ridge.

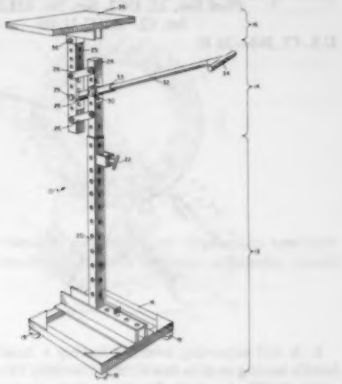
4,482,130

VERTICAL LIFTING AND PLACING APPARATUS

Jose R. Paredes, 146 S. Schutz, El Paso, Tex. 79907

Filed Feb. 1, 1983, Ser. No. 462,944
Int. Cl.³ B60P *1/00*
U.S. Cl. 254—8 R **16 Claims**

1. Vertical lifting apparatus, comprising:
- a base support member,
- a first column depending from said base support member,
- a second column movable parallel to said first column,
- a third column movable parallel to said second column,
- first vertical adjustment means connecting said second column with said first column,
- second vertical adjustment means connecting said third column with said second column,
- one of said first and second vertical adjustment means includes telescoping means movable in preselected increments,
- the other of said first and second vertical adjustment means includes pivotal lifting means comprising a support arm having a threaded portion,
- at least one support journal depending from said support arm adjacent said threaded portion and having an axis perpendicular to said support arm, and



- an axle shaft extendable through said at least one support journal and a selected one of said first, second or third columns.

4,482,131

NAIL EXTRACTOR

Frederick D. Hamilton, 5042 Cadiz Cir., La Palma, Calif. 90623

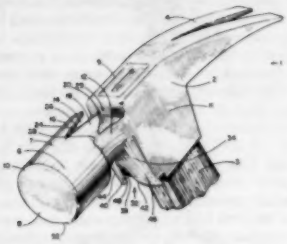
Filed May 17, 1982, Ser. No. 378,519
Int. Cl.³ B25C *11/00*
U.S. Cl. 254—18 **9 Claims**

1. A nail extractor for removing a nail embedded in a board including:
- an extracting head having a forward end and a rear wall, said forward end provided with a gripping groove adapted to engage the shank of a nail;
- an elongated rod having a hammering end and an opposite engaging end;
- a rod holding unit adapted to slidably receive said rod so said rod can slide longitudinally and be turned within said rod holding unit;
- means for engaging said rod hammering end with said extracting head so that they both turn together in a plane substantially perpendicular to the longitudinal axis of said rod and said gripping groove is positioned for movement in alignment with the said longitudinal axis of said rod wherein, in operation, a user holds said rod holding unit and said rod held therein is slid in the direction of said longitudinal axis within said holding unit until said groove in said extracting head engages and grips the shank of a nail to be removed from a board, said extracting head is generally circular in shape and formed with sufficient radius to bend, without breaking, engaged nails around it, and said nail is then removed by rolling said extracting head to one side by rotating said rod within said rod holding unit sufficiently to lift said nail clear of the board in which it is embedded.

4,482,132
NAIL REMOVING HAMMER

Daniel R. Lamansky, R.R. 4, Box 250, Fairfield, Iowa 52556

Filed Sep. 22, 1982, Ser. No. 421,234
Int. Cl.³ B25C 11/00
U.S. Cl. 254—26 R 7 Claims



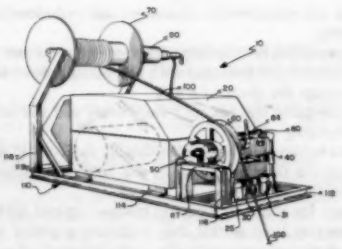
1. A nail removing hammer having a head portion and a handle having an axis extending outwardly from a lower neck portion of the head, the head comprising a forwardly extending poll having a nail striking face, and a rearwardly extending nail-extracting claw, nail-removing means located at the upper surface of the head at a rear portion of the poll comprising a pair of opposing jaws defined by a rearwardly opening V-shaped slot, a transverse channel extending across the entire width of a rear portion of the poll recessed below the upper surface of the hammer, said jaws extending rearwardly over said channel,

second nail-removing means located in a throat portion of the head immediately forward of the neck portion comprising a second pair of opposing jaws defined by a downwardly opening V-shaped slot.

4,482,133
PNEUMATIC WINCH

Carl D. Bishop, 454 Caruthers St., Tallmadge, Ohio 44278

Continuation of Ser. No. 254,668, Apr. 16, 1981, abandoned.
This application Apr. 20, 1983, Ser. No. 486,856
Int. Cl.³ B66D 1/76
U.S. Cl. 254—291 1 Claim



1. A pneumatic winch for applying and maintaining a constant predetermined pulling tension on a lead cable including:

(a) a winding spool for collecting the lead cable;

(b) a first air motor for rotatiing the winding spool to collect the lead cable on said spool;

(c) a first pressure regulator for supplying a predetermined pressure to said motor for rotating the winding spool at a predetermined pressure to apply and maintain a predetermined tension on the lead cable as it is being collected on the winding spool;

(d) a drive wheel;

(e) a second air motor for rotating the drive wheel;

(f) a second pressure regulator for supplying a predetermined pressure to the second air motor for rotating the drive wheel at a predetermined pressure to apply a predetermined tension on the lead cable which is wound about said drive wheel at least one convolution, with said tension exerted on the cable by the drive wheel being greater than the tension exerted on the cable by the winding spool and with said second air motor stalling when the tensions applied to the cable at the drive wheel starts to exceed the predetermined tension supplied thereto by the second regulator to maintain said predetermined tension on the cable;

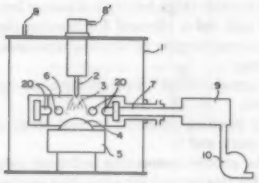
(g) a flow control valve for controlling the rate of air admitted to the second air motor to regulate the rotational speed of said second air motor and to enable said second air motor to obtain the predetermined tension applied to the drive wheel; and

(h) a compressor for supplying pressurized air to the first and second air motors through the regulators.

4,482,134
APPARATUS FOR PRODUCING FINE METAL PARTICLES

Masahiro Uda, Tokyo; Satoru Ohno, Kiyose, and Tutomu Hoshi, Kodaira, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed May 9, 1983, Ser. No. 492,874
Claims priority, application Japan, Dec. 17, 1981, 56-202568
Int. Cl.³ B22F 9/00
U.S. Cl. 266—217 8 Claims



1. An apparatus for producing a particulate metal or alloy having a diameter of less than 5 microns by the reaction of a molten metal or alloy with activated hydrogen, said apparatus comprising

(1) a metal melting hearth for melting a starting metal or alloy placed thereon and supporting the resultant molten metal or alloy,

(2) an arc generating electrode positioned above, and opposite to, the metal or alloy placed on the melting hearth,

(3) a closed vessel for containing the melting hearth and the electrode,

(4) a gas inlet port in the wall of the closed vessel for introducing hydrogen or a hydrogen-containing gas into the vessel,

(5) a suction duct for sucking a gas in the vicinity of the molten metal or alloy and withdrawing it out of the vessel, said duct extending into the vessel through the vessel wall and opening adjacent the molten metal or alloy on the melting hearth,

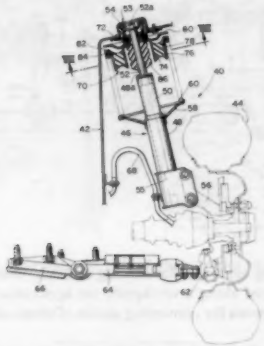
(6) a trap connected to the suction duct for collecting fine particles of the metal or alloy, and

(7) a cooler for cooling the sucked gas provided in the suction duct at a position midway between the trap and the opening of the suction duct adjacent the molten metal or alloy.

4,482,135
MACPHERSON STRUT FRONT SUSPENSION

Takashi Ishida, and Kazutaka Hamada, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 28, 1982, Ser. No. 402,765
Claims priority, application Japan, Jul. 30, 1981, 56-119664
Int. Cl.³ B60G *15/06*; F16F *3/08, 9/54*
U.S. Cl. 267—8 R **8 Claims**



1. A MacPherson strut suspension comprising:

an upright strut assembly having a strut outer tube and a shock absorber received therein, said strut outer tube being adapted to carry at the lower end thereof a steering road wheel, said shock absorber having a piston rod projecting upwardly from the upper end of said strut outer tube to be resiliently and pivotally connected to a vehicle body;

a coil spring placed around said strut outer tube and said piston rod;

a lower spring seat secured to said strut outer tube and retaining the lower end of said coil spring; and

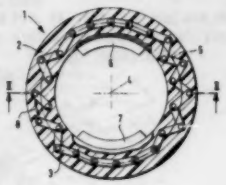
an upper spring seat assembly having concentric inner and outer tubular members, said inner tubular member being rotatably mounted to the vehicle body, said outer tubular member being adapted to retain the upper end of said coil spring, said upper spring seat assembly also having a spring seat resilient member resiliently interconnecting said inner and outer tubular members and an abutment member attached to said inner tubular member to rotate together therewith and engagable with said outer tubular member to limit upward movement of same relative to said inner tubular member, said inner tubular member being in the form of having a tubular wall portion and an annular inward flange portion at the upper end of said tubular wall portion thereof, said inner tubular member being mounted at said annular inward flange portion thereof on a bearing which is in turn mounted on the vehicle body.

4,482,136
ELASTOMERIC LOOP

Franz-Josef Wolf, Bad Soden-Salmünster; Hubert Pletsch, Birkenau, and Gregoire Benneyan, Bad Soden-Salmünster, all of Fed. Rep. of Germany, assignors to WOCO Franz-Josef & Co., Bad Soden-Salmenster, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,196
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133545
Int. Cl.³ F16F *3/08*
U.S. Cl. 267—152 **15 Claims**

1. A suspension device comprising a closed loop of elastomeric material, and a closed loop link chain embedded within said elastomeric material, said link chain having a diameter, when stretched into a circle, which is larger than the median diameter of said closed loop of elastomeric material when in its relaxed state, said link chain having a plurality of pivotally

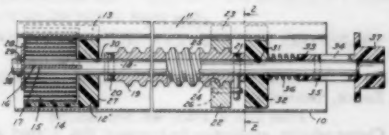


joined links of which at least some are disposed in sawtooth fashion with non-straight angles between adjacently joined links.

4,482,137
COMPARTMENT SHADE

James A. Gavagan, Centerline; Carl M. Petersen, III, Drayton Plains, and Michael J. Ray, Southfield, all of Mich., assignors to Irvin Industries, Inc., Mich.

Filed Dec. 10, 1982, Ser. No. 448,617
Int. Cl.³ E06B *9/208*
U.S. Cl. 267—157 **12 Claims**



1. Compartment shade comprising tube for rolling and unrolling shade between retracted and extended positions, means including mounting brackets supporting said tube in rotational operative position, torsional spring means transmitting shade windup torque between said supporting means and said tube, means for establishing prewind of said spring means in the retracted position of said shade, means accommodating removal of said tube from said mounting brackets, and means for permanently retaining said prewind unaffected by shade removal comprising axially displaceable means completely enclosed within said tube responsive to retractional rotation, and stop means engaged thereby for arresting retraction at said prewound condition.

4,482,138
BODY POSITIONER

Donald C. Spann, Greenville, S.C., assignor to Span-America Medical Systems, Inc., Greenville, S.C.

Division of Ser. No. 906,980, May 17, 1978, Pat. No. 4,185,813. This application Apr. 9, 1979, Ser. No. 28,517
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—328 **6 Claims**

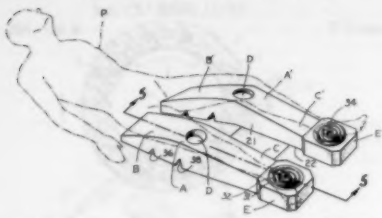
1. Body positioning apparatus for aiding in the support of a joint of a patient comprising:

a support block means constructed of resilient deformable material having a stable base surface generally broadened relative to the height thereof for supporting said block means;

a recess opening formed in said support block means; and

a vertically adjustable support means also constructed of resilient deformable material frictionally received in said recess opening and held therein at a desired elevated

position by such friction offering a yieldable adjustable support in the area of said joint;



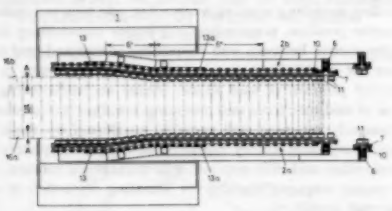
whereby the support point may be adjusted vertically with respect to the support block to reduce pressure at the joint.

4,482,139

TRANSPORT AND SEPARATING APPARATUS FOR FOLDED PRINTED MATTER

Viktor Killer, Greifensee, Switzerland, assignor to Daverio A.G., Zurich, Switzerland

Filed Feb. 2, 1983, Ser. No. 463,296
Claims priority, application Switzerland, Feb. 3, 1982, 657/82
Int. Cl.³ B65H *39/00*
U.S. Cl. 270—52 **3 Claims**



1. Apparatus for transporting and separating folded printed items, which are supplied from a rotary machine on a conveyor in a shingled stream, and in which every two printed items are folded within each other but displaced laterally from each other, and in which the apparatus has as its grasping means rollers attached to an endless transport means guided within tracks, each roller bearing resiliently against at least one adjoining roller and grasping the printed items at their edge between the rollers and transporting them, characterized in that

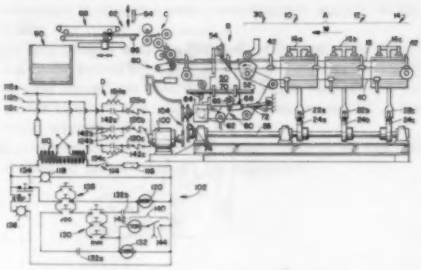
an endless transport means with rollers is positioned laterally on both sides of the shingled stream, the guidance tracks of both transport means being turned within a horizontal region shortly after grasping of the printed items by the rollers longitudinally by a predetermined angle, in such manner that the two transport means diverge in V configuration after being turned by about 90° into a vertical region and draw apart the printed items folded within each other.

4,482,140

START-UP CIRCUITRY FOR STITCHING ASSEMBLIES AND THE LIKE

Keith S. Macey, Rocky River, Ohio, assignor to K. S. Macey Machine Company, Inc., Cleveland, Ohio

Filed Nov. 12, 1982, Ser. No. 440,872
Int. Cl.³ B42G *1/02*; H02P *1/04*
U.S. Cl. 270—53 **16 Claims**



1. A binding apparatus for binding stacks of sheets which are being conveyed along a workpath, the apparatus comprising:

a feeding means for conveying stacks of sheets along a workpath;

a reciprocating stitcher assembly disposed along the workpath for stitching the stacks of sheets conveyed therealong;

a finishing means for finishing the stitched stacks; and,

a power supply including an electric motor for converting electrical power into mechanical and for selectively providing coordinated motive power to the reciprocating stitcher assembly and the feeding means, a run switch for selectively causing electrical power to be provided to the motor, and a timing means for causing a lesser amount of electrical power to be supplied to the motor upon actuation of the run switch to drive the feeding means and stitcher assembly at a first, slower speed, and a greater amount of electrical power to be supplied to the motor at some preselected duration thereafter to drive the feeding means and stitcher assembly at a second, faster speed, whereby at start-up the feeding means and stitcher assembly are driven at the first speed and at the second speed after the preselected duration.

4,482,141

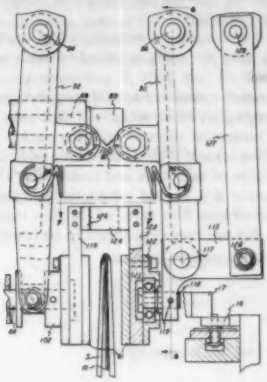
METHOD AND APPARATUS FOR CONVEYING FOLDED SHEETS USING ORBITALLY GRIPPING AND RELEASING CLAMP PADS

James R. Moser, Easton, Pa., assignor to Stobb, Inc., Clinton, N.J.

Filed Sep. 22, 1982, Ser. No. 421,157
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—54 **19 Claims**

1. Apparatus for conveying folded sheets comprising a first conveyor for supporting the folded sheets in an inverted V-shaped orientation with the fold at the top thereof, a blade-type conveyor in sheet conveyance communication with said first conveyor for receiving the sheets in the inverted V-shaped orientation and having upstanding blades for extending into the fold at locations spaced from one end of the folded sheets, a pair of clamp pads disposed in alignment with said blade-type conveyor and adjacent said blades on opposite sides of the path of said blades for closing onto the one end of said folded sheets, said clamp pads being movable toward and away from each other and also in the plane of movement of said blade-type conveyor, and a powered support on which said clamp pads

are mounted for closing said clamp pads onto the folded sheets and for moving the clamp pads away from said blade-type



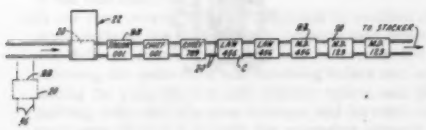
conveyor for removing the folded sheets from said blade-type conveyor.

4,482,142

METHOD OF SIGNATURE COLLATING OF DIFFERENT EDITIONS

William B. McCain, Hinsdale, Ill., and Todd S. Rankin, Fairfield, Conn., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Dec. 30, 1982, Ser. No. 454,724
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—54 **4 Claims**



1. A method of collating binder production of books in a sequence of different editions, which differ as to content, to another sequence on a conveyor so they will be delivered in the other sequence from the conveyor and comprising the following steps occurring in the following order between (1) a binder station where the books are bound and (2) a line of feeders, one for each edition, juxtaposed and equipped to deliver books one by one to said conveyor:

A. feeding the books in a continuous stream from the binder station as a separate edition to a wrap-up cylinder where that edition is spiral wound thereon as an imbricated supply;

B. completing a plurality of separate edition supplies each on its own wrap-up cylinder in compliance with step A;

C. assigning the wrapup cylinder supplies to the respective feeders by edition and unwinding the cylinders to release the books by edition while supplying each particular edition as it is being released to an assigned edition feeder so each feeder feeds only one edition; and

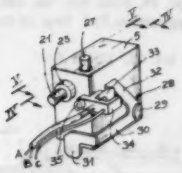
D. programming the delivery of books from the feeders to the conveyor so the books are arranged on the conveyor one after another in the other sequence specified.

4,482,143

DEVICE FOR SENSING REMOVAL OF STACKED WORKPIECES

Giancarlo Della Torre, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Feb. 14, 1983, Ser. No. 465,958
Claims priority, application Italy, May 17, 1982, 21310 A/82
Int. Cl.³ B65H *3/22*
U.S. Cl. 271—18.3 **5 Claims**



1. A device for sensing removal of workpieces from a stack in a machine of the type having at least one pickup head with gripping members carried on a base unit for rotative movement and alternate vertical movement toward and from the upper workpiece in a stack, said device comprising:

(a) a sensing means pivotably mounted on the pickup head;

(b) means connected to said sensing means for pivoting it to an elevated position for maintaining continued operation of the machine upon engagement and gripping of a workpiece by the pickup head; and

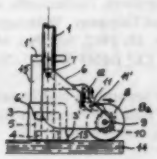
(c) means attached to said sensing means for detecting failure of the pickup head to engage and grip a workpiece upon failure of said pivoting means to pivot said sensing means to an elevated position.

4,482,144

GRASPING DEVICE FOR STACKED WORKPIECES

Kenneth B. Glassby, Rapallo, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Mar. 18, 1983, Ser. No. 476,699
Claims priority, application United Kingdom, Apr. 1, 1982, 8209702
Int. Cl.³ B65H *3/30*
U.S. Cl. 271—21 **6 Claims**



1. A grasping device for forming a fold in a piece of textile material to facilitate its removal from the top of a stack of a multiplicity of such pieces, said grasping device comprising:

(a) a block (3) for engaging the upper piece of textile material on the stack;

(b) a spindle (1) extending upwardly from said block (3) and mounted for vertical sliding movement therein;

(c) means defining a support bracket (6) pivotably attached at one end on said spindle including:

(i) a roller (8) rotatably mounted on the opposite end thereof for movement toward and away from said block (3) during the upward and downward movement respectively of said spindle; and

(d) means interconnecting said roller (8) and support bracket (6) for preventing rotation of said roller during its move-

ment toward said block (3) to effect the formation of a fold therebetween.

4,482,145

APPARATUS FOR SUPPLYING SUCTION AIR TO ROTARY APPLICATOR

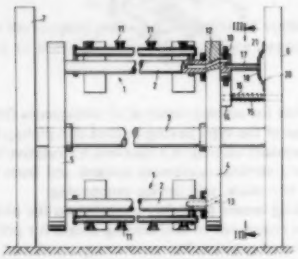
Richard Feldkämper, Lengerich, and Bernhard Philipp, Ibbenbüren, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 485,904

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214342

Int. Cl.³ B65H *3/12*

U.S. Cl. 271—95 **14 Claims**



1. Apparatus for supplying suction air to a rotary applicator, comprising suction rollers which planetate about a central shaft, each carry suckers arranged in an axial row and the shafts of which are mounted in spaced discs secured on the central shaft, and a rotary transmission consisting of two control valve discs for connecting the conduits leading to the suckers to a conduit leading to a suction air pump over a zone corresponding to an approximate angle of rotation of 90° of the discs, characterised in that the first control valve disc is formed directly by one of the discs (4) mounting the suction roller shafts (2) and the second control valve disc (14) is secured in the frame (6) and held in sealing sliding contact with the disc (4).

4,482,146

DISPENSER OF SINGLE FILM SHEETS

Willem A. Hoorn, Amersfoort, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 24, 1982, Ser. No. 444,088

Int. Cl.³ B65H *3/06, 3/56*

U.S. Cl. 271—127 **14 Claims**

1. An apparatus for separating and dispensing a single film sheet from a stack of film sheets loaded therein in a substantially vertical position, comprising

(1) a casing;

(2) a film stack holding means within such casing for holding a stack of generally rectangular film sheets in a substantially vertical position, including;

(a) a pressure plate pressing against one side of said stack; a pivotally mounted base plate supporting the opposite side of said stock and spaced from said pressure plate, having an upper end hingedly mounted in said casing so as to permit the base plate to swing from the stack; and associated actuating means mounted on the base plate and the casing for urging the lower part of the base plate to swing alternately toward and away from the pressure plate;

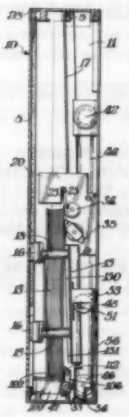
(c) film stack support means defining a plane located below and extending between said pressure plate and said base plate for supporting said film stack along one lower edge thereof between said pressure and base plates:

(d) friction reducing means extending through said base plate which function to provide film support points along an upper end of said film stack, whereby a space is maintained between the upper end of said film stack and said base plate;

(e) at least one elongated combination film stack retainer/-separator cam pivotedly mounted on said stack support means; and

(f) spring means connected to said cam and stack support means urging an inner surface of said cam in contact with an outermost sheet of said film stack,

(3) an upper film separator mounted within said casing above the upper edge of said stack and comprising a block having a separator slot located substantially in line with the aforesaid outermost film sheet of the film stack, sized to allow one, but not two, film sheets to be inserted therein simultaneously;



(4) at least one driven, rotatable, reversible, resilient first cam wheel mounted in said casing and extending through the base plate, and positioned so as to intermittently contact the aforesaid outermost film sheet at a point near the upper edge thereof, and means for selectively driving said first cam wheel; whereby when the cam wheel is driven through an arc clockwise it pushes said outermost film sheet into the separator slot in the upper film separator; and

(5) a pair of drive wheels located in said casing below the film stack support means and forming a nip at a point below and behind the separator cam, and associated drive means for selectively driving said drive wheels; whereby when the cam wheel is rotated through an arc counterclockwise it pushes the aforesaid outermost sheet into the nip of the drive wheels, thereby separating said outermost film sheet from the film stack and dispensing it.

4,482,147
SHEET ARRANGING SYSTEM

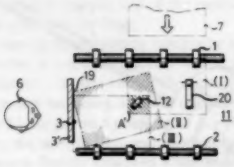
Kunio Hibi, Yokohama; Tamaki Kaneko, Fujisawa; Sunao Ikeda, Yokohama; Tugio Okuzawa, Tokyo; Yohtaro Kakitani, and Hideo Kikuchi, both of Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Japan

Continuation of Ser. No. 188,946, Sep. 19, 1980, abandoned. This application Aug. 5, 1982, Ser. No. 405,380

Claims priority, application Japan, Sep. 27, 1979, 54-133892[U]; Sep. 29, 1979, 54-134807[U]; Dec. 28, 1979, 54-181402[U]

Int. Cl.³ B65H *9/14*

U.S. Cl. 271—229 **3 Claims**



1. A sheet arranging system comprising:

receiving rollers (1) for receiving and feeding a sheet in a feed direction with a rear edge of the sheet aligned with a rearward reference (30), the sheet having a width between a narrowest and a broadest dimension and having a center of gravity;

delivery rollers (2) for delivering the sheet in the feed direction with a front edge of the sheet aligned with a forward reference, said receiving and delivering rollers being spaced apart in the feed direction by an amount which is less than twice the narrowest dimension of a sheet to be fed in the feed direction so that an area of overlap (F) exists between the sheet as it leaves the receiving rollers and as it enters the delivery rollers, the delivery rollers being distributed over more than the broadest dimension;

a forward reference edge (3) interposed between said receiving rollers and said delivery rollers and extending parallel; to the feed direction;

only one sheet moving roller (12) mounted for rotation at an acute angle to the feed direction between said receiving and delivery rollers and in said area of overlap (F) for receiving the sheet from said receiving rollers and introducing the same sheet to said delivery rollers, said sheet moving roller also disposed between said forward reference edge (3) and a straight line extending through the center of gravity of a sheet to be fed at the time the sheet to be fed is released from the receiving rollers, said straight line being parallel to said acute angle;

drive means connected to said sheet moving roller for rotating said sheet moving roller so that the sheet to be fed is rotated to engage a trailing edge thereof adjacent said forward reference edge, against said forward edge before any other part of the sheet engages said forward reference edge; and

a braking member (20) in the vicinity of the rearward reference and upstream of said sheet moving roller in the feed direction for braking movement of a sheet in the feed direction adjacent the rearward reference.

4,482,148
VARIABLE-WIDTH FRICTION-FEED PAPER HANDLING APPARATUS

Robert T. Stewart, Jr., Verona, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Apr. 26, 1982, Ser. No. 371,533

Int. Cl.³ B65H *5/04*

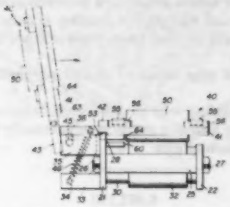
U.S. Cl. 271—273 **21 Claims**

13. A variable-width friction-feed paper handling apparatus for feeding paper in a predetermined feed direction, said apparatus comprising:

a rotatable drive shaft extending perpendicular to the feed direction; and

two carriage assemblies carried by said drive shaft and movable longitudinally therealong for accommodating varying widths of paper therebetween;

each of said carriage assemblies including a drive roller coupled to said drive shaft for rotation thereby about a longitudinal axis perpendicular to the paper feed direction,



a gate means mounted for transverse pivotal movement with respect to the longitudinal axis of said drive roller between a loading position completely exposing the drive roller and thus accommodating placement of paper between said carriage assemblies and a feeding position, and a pressure roller rotatably carried by said gate means and movable therewith, said pressure roller being disposed for parallel frictional cooperation with said drive roller frictionally to feed paper therebetween in the feed direction when said gate means is disposed in the feeding position thereof.

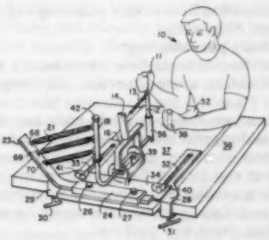
4,482,149
ARM EXERCISING DEVICE

David E. Weldon, 1010 Park Pl., Yreka, Calif. 96097

Continuation of Ser. No. 284,587, Jul. 17, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 504,989

Int. Cl.³ A63B *23/00*

U.S. Cl. 272—67 **1 Claim**



1. An arm exercising device comprising:

a base;

means for attaching said base to a surface;

bearing means mounted upon said base;

a round rod supported by said bearing means on a substantially horizontal axis, having a first end and a second end offset from said first end;

a tension arm rigidly attached to said first end of said round rod and extending substantially perpendicularly with respect to said horizontal axis;

tension bar means attached to said base by lateral adjustment means;

first tension means connected between said tension arm and said tension bar means so that tension can be increased or

decreased throughout a given range through lateral adjustment of said tension bar means with respect to said base;

an exercise arm having a first end and a second end, said first end being pivotally attached by pivot means to said second end of said round rod on an axis substantially perpendicular to said horizontal axis;

a first hand grip rotatably attached to said second end of said exercise arm;

means for adjusting the length of said exercise arm to match forearms of different lengths;

second tension means connected between said exercise arm and said round rod so that tension is created when said exercise arm is pivoted away from said second end of said round rod;

a second hand grip attached to and perpendicular to said base, and

spring-loaded safety stop means which, when engaged, hold said exercise arm in a position substantially perpendicular to said horizontal axis.

4,482,150

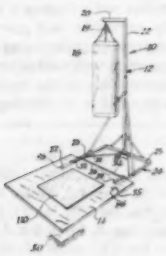
HEAVY BAG AND STAND

Norman D. Levine, 1300 SW. 12th Ave., Pompano Beach, Fla. 33060

Filed Feb. 8, 1982, Ser. No. 346,892

Int. Cl.³ A63B *69/00*

U.S. Cl. 272—78 **3 Claims**



1. A combination heavy body punching bag, support stand and platform, comprising:

a heavy body punching bag;

a resilient removable platform means having a top surface, a bottom surface, a central portion, a first edge and a second edge;

a support means suspending said body bag above the platform, said support means having a floor frame means for placement on a floor, a vertical frame means connected at its lower end to said floor frame means, a horizontally extending cantilevered heavy bag suspension member the upper end of said vertical frame means for suspending said body bag above said platform;

an attachment means connecting said body bag to said horizontal suspension member; a bracket means connected to said floor frame means, said bracket means releasably connected to said first edge of said platform to serve as the sole support for elevating said bottom surface above a support floor.

4,482,151

EXERCISING DEVICE

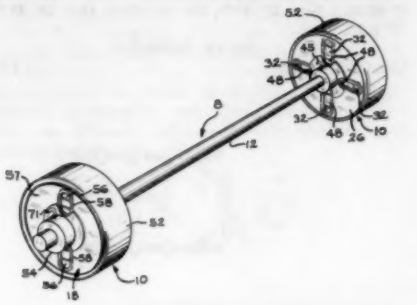
Brian R. Zwilling, Longmeadow, Mass., assignor to Questor Corp., Tampa, Fla.

Filed Jun. 1, 1983, Ser. No. 499,829

Int. Cl.³ A63B *13/00*

U.S. Cl. 272—123 **11 Claims**

1. An exercising device comprising a bar, a pair of housings mounted on the bar, each of said housings having an end wall and a cylindrical peripheral wall, each housing adapted to receive a plurality of concentric annular weights, said weights being of dimensions whereby the weights are snugly nested together in each housing, the end wall of each housing having means providing a hub portion, a cover for each of the housings, each of said covers having means providing a hub portion, said innermost weight in each housing being snugly received on the bar, the outermost weight in each housing being snugly received within the cylindrical peripheral wall of a housing, the end wall of each housing having inwardly extending projections adjacent an intermediate weight in said housing, an open area in the end wall of each of said housings to facilitate removing weights from said housing, and means for securing the hub portions of the housings and covers to the bar.



4,482,152

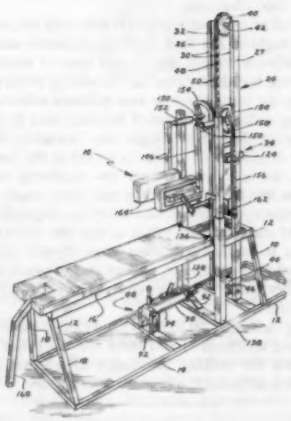
EXERCISE EQUIPMENT

Leslie C. Wolff, P.O. Box 188, Hackensack, Minn. 56452

Filed Oct. 13, 1982, Ser. No. 434,166

Int. Cl.³ A01B *21/00*

U.S. Cl. 272—130 **4 Claims**



4. Equipment for exercising the muscles of a user by providing resistance to repetitive movements of specific body portions of the user, said exercise equipment including:

A. a horizontally extending main frame including a base sub-frame adapted to be supported on a floor and a bench above the sub-frame supported in spaced, parallel relation to the sub-frame, the bench having a horizontal longitudinally extending main axis;

B. an elevator leg integral with and extending substantially vertically upwardly from the main frame, said elevator leg providing a vertical guideway extending from its upper portion to its lower portion;

C. an elevator carriage mounted to ride in said guideway;

D. an idler pulley and a driven pulley, one rotatably mounted in a top portion and the other in a bottom portion of said elevator leg each being mounted in fixed position with respect to the other;

E. an endless driven flexible elevator band operably mounted on said pulleys to have first and second mutually parallel, substantially vertical runs situated in parallel relation to the guideway;

F. means to operably couple one of the runs of the elevator band to the elevator carriage;

G. a pair of stanchions extending integrally upwardly from the main frame in parallel spaced relation to the elevator leg and adjacent the first end of the bench;

H. actuating means including a pair of actuating arms pivotably mounted to upper end portions of the stanchions to be movable by the user in first and second directions;

I. actuated means fixedly mounted with respect to the main frame and including a movable member movable in a first direction and in a second reverse direction, said actuated means providing resistance to movement of the movable member when moving in its first direction;

J. means for operably linking the actuating means through the elevator carriage and the endless elevator band to the driven pulley to cause the driven pulley to rotate in a first direction when said actuating means is moved in its first direction; and

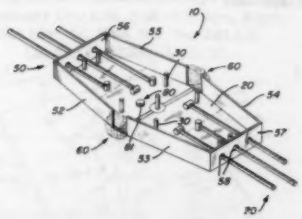
K. means operably coupling the movable member of the actuated means to the driven pulley to cause said movable member to move in proportion to the rotation of the driven pulley, the movable member of said actuated means moving in its first direction as the actuating means moves in its first direction.

4,482,153

KNOCK-OUT GAME

Don W. Gibbs, 4739 Hackamore Dr. N., Colorado Springs, Colo. 80918

Filed Feb. 18, 1983, Ser. No. 467,983
Int. Cl.³ A63F 7/06
U.S. Cl. 273—85 R **10 Claims**



1. A game board and playing pieces comprising:

an elongated generally hexagonal playing surface,

a wall member surrounding said playing surface, and having apertured end walls, and side walls that create goal openings on both sides of the playing surface,

propelling means extending through the apertures in each of the end walls, and

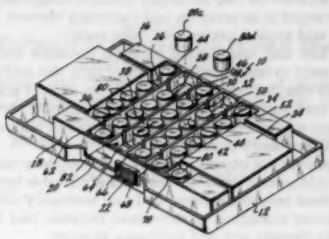
a game piece adapted to be contacted by said propelling means, to direct the game piece through said goal openings.

4,482,154

GAME APPARATUS WITH MOVING OBJECTS

Masanori Mizunuma, and Hiroyuki Watanabe, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Japan

Filed May 7, 1982, Ser. No. 376,022
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S **10 Claims**



1. A game apparatus which comprises:

a housing;

a stationary element located on said housing, said stationary element including means dividing said stationary element into a plurality of sections;

a first movable element located on said housing in association with said stationary element, said first movable element including means dividing said first movable element into a plurality of sections equal in number to the number of section on said stationary element, said first movable element movable with respect to said stationary element such that in a first position one of said section on said first movable element is in alignment with one of said section on said stationary element and in a second position said one of said section on said first movable element is in alignment with the next adjacent section on said stationary element located on one side of said one of said sections on said stationary element and in a third position said one of said sections on said first movable element is in alignment with the next adjacent section on said stationary element located on the other side of said one of said section on said stationary element;

a plurality of objects of at least two different classes located on said housing and movably positionable in said section of said first movable element and said sections of said stationary element, said objects capable of being moved back and forth between said sections on said first movable element and said sections on said stationary element and said objects movable from any of one of said section of said stationary element to a next adjacent section of said stationary element by moving said objects from one of said sections on said stationary element to one of said section on said first movable element and moving said objects with respect to said one of said sections on said stationary element by moving said first movable element with respect to said stationary element followed by moving said objects from said first movable element to the next adjacent section on said stationary element after completion of said movement of said first movable element with respect to said stationary element;

a second movable element located on said housing in association with said first movable element;

said second movable element including means dividing said second movable element into a plurality of sections equal in number to the number of sections on said stationary element, said second movable element movable with respect to said stationary element such that in a first position one of said section on said second movable element is in alignment with one of said sections on said stationary element and in a second position said one of said sections on said second movable element is in alignment with the

next adjacent section on said stationary element located on one of the sides of said one of said sections on said stationary element and in a third position said one of said section on said second movable element is in alignment with the next adjacent section on said first stationary element located on the other side of said one of said sections on said stationary element;

said sections on said stationary element comprising sections arranged in an array on said stationary element with each of said section having two open ends;

said first and said second movable elements located with respect to said stationary element such that said first movable element moves along one of the ends of said sections of said stationary element and said second movable element moves along the other of the end of said sections on said stationary element;

said plurality of objects movably positionable in said sections of said second movable element and movable between said second movable element and said stationary element in a manner analagous to movement between said first movable element and said stationary element.

4,482,155

GOLF CLUB ALIGNMENT INDICATOR APPARATUS

Raymond H. Higley, 1401 Briarwood Rd., Atlanta, Ga. 30319

Filed Sep. 30, 1982, Ser. No. 431,579

Int. Cl.³ A63B *69/36, 53/14*

U.S. Cl. 273—162 B **8 Claims**

1. An alignment indicator apparatus for a golf club, said apparatus comprising:

a fluid-filled housing connectable to the uppermost end portion of a golf club, said golf club having a face portion of predetermined vertical loft and a leading edge;

float means contained within said housing and operatively associated with the fluid in the housing for indicating true vertical;

a first marking indicium (**28**) comprising a circular line disposed on said housing for visual correlation with said float means, said first marking indicium (**28**) corresponding to the vertical loft of said face of said golf club; and

second marking indicia (**35**) comprising a plurality of parallel circular lines disposed on said housing so as to each visually intersect said first marking indicium (**28**) and for visual correlation with said float means, said second marking indicia (**35**) indicating certain degrees of incline relative to the horizontal upon which said golf club is placed, as defined by said leading edge of said golf club,

whereby directing said face portion along a desired line-of-aim perpendicular to said face portion of said golf club, and locating said float means at a point on said first marking indicium (**28**) properly orients said face portion of said golf club according to said predetermined vertical loft, and viewing said float means relative to said second marking indicia (**35**) indicates said degree of incline relative to the horizontal upon which said golf club is placed.

4,482,156

TARGET DEVICE

Jörgen B. Karlsson, Huskvarna, Sweden, assignor to Saab Training Systems Aktiebolag, Huskvarna, Sweden

Filed Dec. 12, 1983, Ser. No. 560,137

Claims priority, application Sweden, Dec. 13, 1982, 8207104

Int. Cl.³ F41J *7/00*

U.S. Cl. 273—406 **6 Claims**

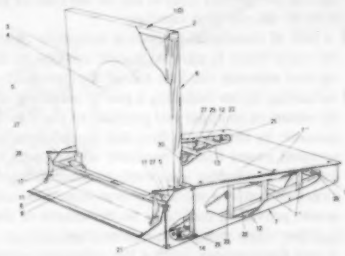
1. A target device comprising a substantially board-like target member having opposite front and rear faces and opposite upper and lower ends and means providing for movement of the target member between a protected position and a position of use in which its front face is substantially upright and exposed to be shot at, said target device being characterized by:

A. means defining a housing having

(1) opposite front and rear walls and

(2) opposite side walls and wherein the target member can occupy a protected position between the side walls, extending substantially horizontally with its front face downward and its lower end near the rear wall;

B. elongated guiding means fixed in said housing, near the



bottom thereof, extending from near said rear wall to near said front wall;

C. controlled means on the target member, near the lower end thereof, slidingly cooperable with said guiding means to confine the lower end of the target member to backward and forward movement in the housing; and

D. sliding support means on the housing, adjacent to its front wall and at a level above the front end portion of said guiding means, with which said front face of the target member is at all times slidably engaged and which cooperates with said guiding means and said controlled means to constrain the target member to swing up to its position of use as its lower end is moved forward.

4,482,157

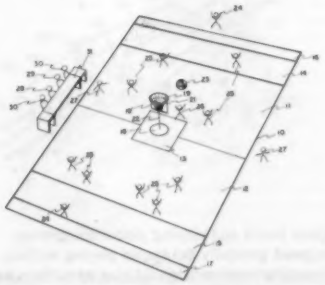
TIP BALL GAME

Algernon McNeil, 327 Finch St., Wilson, N.C. 27893

Filed Feb. 2, 1983, Ser. No. 432,692

Int. Cl.³ A63B *71/02*

U.S. Cl. 273—411 **7 Claims**



1. The method of playing a ball type sport game comprising: designating an elongated court having ends and a central area; providing a goal means approximately five feet in diameter disposed about eight feet above the middle of the center area; designating areas of said court adjacent its ends as special backman box play areas; designating an area generally in the

center of said central area and below said goal means as a special goalie box play area; designating areas adjacent to and between said special backman box play areas and said special goalie box play area as special free tip play areas; designating areas between said special free tip play areas and said special goalie box area as volley play areas; providing rules of game play; and playing a ball type sport type game on said court by said rules whereby an improved

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4,482,158

STERN TUBE SEAL DEVICE

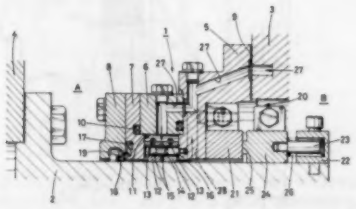
Kenichiro Ishitani, Tokyo; Toshiharu Hamasaki, Nagasaki; Shoji Shiomi, and Eiichi Kawamura, both of Saitama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Eagle Industry Co., Ltd., both of Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,329

Claims priority, application Japan, Apr. 21, 1983, 58-58717

Int. Cl.³ F16J *15/38, 15/40*

U.S. Cl. 277—3 **1 Claim**



1. A stern tube seal device characterized in that a plurality of annular case members are arranged in the outer periphery of a shaft, an annular recess portion is provided in the inner peripheral surface of a hole of said case members, a segment seal member is arranged within said annular recess portion, a feeding mechanism is provided to feed pressure gas to said annular recess portion closed by said segment seal member, a lip seal member is arranged at the sea water side of said segment seal member, and a mechanical seal, packings or other float seal member are arranged at the lubricating oil side thereof.

4,482,159

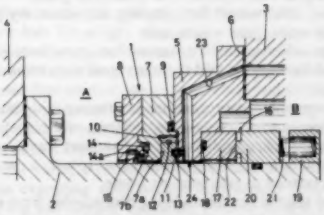
STERN TUBE SEAL DEVICE

Kenichiro Ishitani, Tokyo, and Eiichi Kawamura, Saitama, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Eagle Industry Co., Ltd., both of Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,330

Int. Cl.³ F16J *15/40, 15/38*

U.S. Cl. 277—3 **1 Claim**



1. A stern tube seal device characterized in that an annular case member is arranged in the outer periphery of a shaft, a mechanical seal for sealing a portion between said case member and the peripheral surface of the shaft is disposed at a position closer to the ship in the inner periphery of said case member, an annular recess portion is formed externally of the ship of said mechanical seal in the inner peripheral surface of said case member, a limited leaking type seal in sliding relation with the peripheral surface of the shaft is fitted into said annular recess portion, and a pressure fluid feed line, which is open to an annular space between said limited leaking type seal and said mechanical seal is feed pressure fluid, is provided.

4,482,160

WATERPROOF SEAL RING FOR POWER BRAKE BOOSTER HOUSING

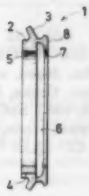
Kunio Yanagi, and Munesato Andoh, both of Higashimatsuyama, Japan, assignors to Jidoshi Kiki Co., Ltd., Japan

Filed Mar. 28, 1984, Ser. No. 594,109

Claims priority, application Japan, Apr. 14, 1983, 58-55763[U]

Int. Cl.³ F16J *15/16, 15/32*

U.S. Cl. 277—12 **3 Claims**



1. A waterproof seal ring to be fitted between the contacting surfaces of a master cylinder body and the front wall of a power booster housing surrounding a bulge of the housing through which a push rod is inserted and having a downwardly extended passage groove formed in the lower part of the wall, said seal ring being characterized by

(a) a first recess formed in the lower end portion thereof for communication with said passage groove,

(b) a vent groove formed circumferentially on the pressure-contact side thereof, communicating at the lower end with said first recess, and

(c) a second recess formed above said first recess to provide communication between the space inside said bulge and said vent groove.

4,482,161

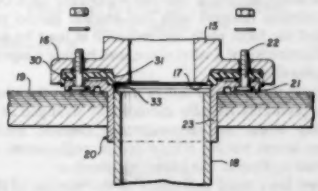
TOILET BOWL GASKET OF RUBBERLIKE MATERIAL HAVING COMPRESSIBLE CONCENTRIC RIDGE RINGS ON BOTH SIDES

Lewis B. Izzi, Sr., Shelby, N.C., assignor to Plastic Oddities, Inc., Shelby, N.C.

Continuation-in-part of Ser. No. 370,187, Apr. 21, 1982, Pat. No. 4,423,526. This application Nov. 28, 1983, Ser. No. 555,638

Int. Cl.³ F16J *15/10*

U.S. Cl. 277—207 A **9 Claims**



1. A gasket for sealing the joint between a drainage pipe and a toilet bowl in a coupling of the type wherein the horn of a toilet bowl positioned on a floor surface by bolting its base to a mounting flange fitting connected with a drainpipe terminat-

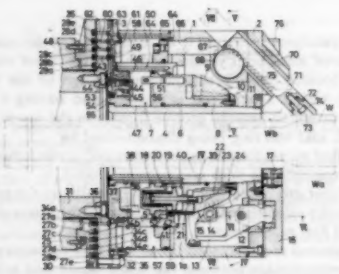
ing at or below the floor surface to prevent leakage of gas or fluids through the coupling joint, comprising in combination, an integral gasket ring of rubberlike elastic material having a memory so that it returns to its original shape after flexing presenting a central aperture sealing portion shaped to flexibly seat against the horn of said toilet bowl with a thin sheet-like ring web portion extending laterally therefrom for fitting between the mounting flange and the toilet bowl defining integrally thereon at least two concentric raised ridges staggered on each side of the web along the web and tapered from the web portion outwardly to form wedges of substantially right triangular form for providing a liquid and gas retaining sealing joint supplementing the central aperture seal against the horn and an outer rim formed concentrically about the central aperture which extends downward in installed position to mate with the outer circumference of said flange and hold the gasket frictionally in place seated to receive the horn of the toilet into the central aperture sealing portion.

4,482,162

AUTOMATIC CHUCK FOR WORKPIECES

Kazuhiro Anegawa, Osaka, Japan, assignor to Koyo Machine Industries Company, Inc., Osaka, Japan

Filed Jul. 30, 1982, Ser. No. 403,474
Claims priority, application Japan, Feb. 10, 1982, 57-20177
Int. Cl.³ B23B *31/30*
U.S. Cl. 279—1 J **3 Claims**



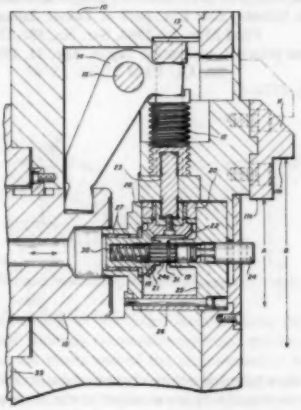
1. An automatic chuck for a workpiece comprising:
(a) a chuck main body;
(b) an inner cylinder fixed to the chuck main body by a front plate and a rear plate concentrically therewith;
(c) an intermediate cylinder fixed between a partition wall of the chuck main body and the rear plate concentrically with the chuck main body;
(d) an annular piston slidable axially of the chuck main body provided between the intermediate cylinder and the inner cylinder;
(e) at least three lock cylinders arranged at an equal spacing along the circumference of the annular piston;
(f) an annular adjusting member supported on a cylindrical rod portion integral with the annular piston projecting toward the front plate and movable at least by an amount of eccentricity of a workpiece, and having a tapered outer peripheral surface;
(g) at least three clamp levers mounted on the chuck main body pivotably radially thereof and arranged at an equal spacing along the circumference thereof, each of the clamp levers having a rear end in engagement with the tapered surface of the adjusting member;
(h) clamp jaws equal in number to the number of the clamp levers and supported on the front plate movably only radially thereof, the clamp levers having front ends engaged with the clamp jaws individually;
(i) lock pistons housed in the annular piston slidably axially thereof; and
(j) a wedge-like lock member attached to the rod portion of each of the lock pistons and movable forward and backward in a space between the outer peripheral surface of the annular piston rod portion and the slanting bottom surface of an axial groove formed in the inner periphery of the adjusting member.

4,482,163

SPINDLE POWERED ADJUSTABLE CHUCK

Frank A. Depweg, Fairfield, Conn., assignor to Litton Industrial Products, Inc., New Britain, Conn.

Filed Sep. 29, 1982, Ser. No. 428,046
Int. Cl.³ B23B *31/16, 31/26*
U.S. Cl. 279—1 H **3 Claims**



1. A spindle powered adjustable chuck for forcefully gripping a workpiece capable of automatically adjusting gripping diameter comprising
a support frame having a plurality of radially oriented jaw receiving compartments,
jaw means including a plurality of jaws being displaceable within said jaw receiving compartments, and worm gear means operatively associated with each jaw for radially displacing said jaw means,
clamping means for simultaneously displacing said jaw means to a clamping position for forcefully engaging the workpiece therebetween preparatory to rotating the chuck for operation,
spindle means for rotatively driving said support frame,
adjusting means for simultaneously changing the gripping diameter of said jaw means including
planetary gear train means including an internally splined sun gear and a plurality of planetary gears,
splined shaft means for coupling said planetary gears to said worm gear means, and
two position splined key means for operatively engaging and disengaging said planetary gear train means, including
compression spring means for biasing said splined key means to a first position whereat said planetary gear train is fixed relative to said support frame, whereby rotation of said spindle can rotate a workpiece clamped to said support frame,
said splined key means being displaceable from said first position to second position acting against said compression spring means, thereby
rotationally fixing the sun gear of said planetary gear train means
whereby said support frame is rotatively free of said sun gear,
so that rotation of said support frame rotatively drives said planetary gear train means, thereby

adjusting said gripping diameter through said worm gear means.

4,482,164

STABLE STRUCTURALLY RIGID, MOBILE CARRIAGE ASSEMBLY AND BASE THEREFOR

Norbert L. Cwik, Northfield, Ill., assignor to Quaker Industries, Inc., Antioch, Ill.

Continuation of Ser. No. 371,948, Apr. 26, 1982, abandoned. This application Mar. 12, 1984, Ser. No. 587,847

Int. Cl.³ B62B *1/10*

U.S. Cl. 280—47.24 **6 Claims**

1. A structurally rigid, stable and mobile load-carrying assembly including a base, and a one-piece, upstanding, bilegged, load-supporting frame member having a pair of legs, said frame member including support means for supporting a cantilevered load, said base comprising: a pair of elongate feet, each foot comprising a plastic resin material and having a pair of spaced sidewalls, each foot defining a longitudinal axis between respective ends thereof and including respectively a rotatable wheel disposed within one end thereof between said sidewalls and a pad at an opposite end thereof extending between said sidewalls, said wheel of each said respective foot being aligned within said respective foot relative to the other wheel in the other foot so as to provide said feet with mobility substantially in the direction of the longitudinal axes thereof; a stiffening member comprising an axle having spaced opposite ends, each end of said stiffening member being carried by a respective one of said feet to keep said longitudinal axis of one of said feet in fixed relation with said longitudinal axis of the other of said feet, said axle being supported by both sidewalls of each foot and rotatably carrying said wheels; mounting means formed within each one of said feet and mounting therein an end portion of a respective one of said pair of legs of said frame member, each respective one of said mounting means forming a cavity between said sidewalls superimposed intermediate a spaced pair of load-bearing regions of said respective foot for snugly receiving a respective one of said pair of leg end portions, location of said respective load-bearing regions being defined to be where said pad and said wheel of each said foot contact the ground when said frame member is supporting said cantilevered load; and said support means including a pair of substantially parallel, load-supporting arms, each one of said arms respectively being vertically, releasably positionable along a respective one of said legs, each one of said arms extending substantially horizontally from said respective leg and slightly upwardly relative to said respective foot for retaining said cantilevered load proximate to said frame member, each one of said arms further including a finger oriented upwardly and located at an end of said arm in distal relation to said frame member, whereupon said feet, stiffening member and mounting means co-act whereby to provide said base and said load-carrying assembly with structural rigidity, stability and mobility when said load is carried by said arms.

4,482,165

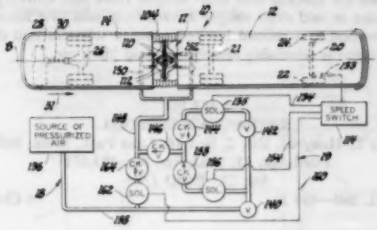
DAMPING SYSTEM FOR ARTICULATED VEHICLE

James M. Dawson, Ortonville, and David J. Taylor, Pontiac, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1982, Ser. No. 447,028

Int. Cl.³ B62D *53/00*

U.S. Cl. 280—432 **2 Claims**



1. In an articulated vehicle having a front section and a rear section interconnected by a hinge connection which allows relative angular displacement of said front and rear sections about a vertical axis, a damping system located at said hinge connection for resisting road induced relative movements of said front and rear sections about said vertical axis, after said vehicle attains a first predetermined speed, said damping system including a friction device located at said hinge connection, said friction device comprising a friction plate member and fluid-operated brake means for applying a clamping force to said friction plate member when supplied with pressurized fluid, first means for supplying pressurized fluid to said brake means at a predetermined pressure so as to cause said friction device to provide a first level of resistance to said relative movements, second means for supplying pressurized fluid to said brake means at a pressure higher than said predetermined pressure so as to cause said friction device to provide a second level of resistance to said relative movements, said second level of resistance being greater than said first level of resistance, and an electronic control circuit including means for sensing the speed of said articulated vehicle and for automatically actuating said first means when said articulated vehicle attains said predetermined speed and for actuating said second means when said articulated vehicle attains a second predetermined speed which is greater than said first predetermined speed so that said damping system increases its resistance to said road induced relative movements of said front and rear sections in accordance with an increase in the speed of said articulated vehicle.

4,482,166

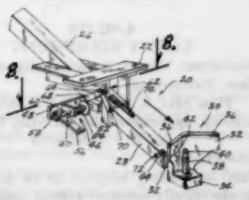
HITCHING GUIDE

Ferne R. Van Antwerp, R.R. 1, Unionville, Iowa 52594

Filed Aug. 9, 1982, Ser. No. 406,334

Int. Cl.³ B60D *1/04*

U.S. Cl. 280—479 A **21 Claims**



1. A hitching guide for connecting a trailing implement draft

tongue to a draft vehicle, said draft tongue having an aperture formed near the distal end thereof, said hitching guide comprising:

a frame attached to said draft vehicle;

a guide block mounted on said frame and including forwardly converging sides disposed to contact the draft tongue and coaxially align the draft tongue to a first hitching position wherein said draft tongue aperture is disposed in coaxially aligned relationship with a hitch pin; and

means for spacing said draft tongue from said converging sides as said draft tongue moves from said first hitching position to a second hitched position wherein said draft tongue is releasably attached to said hitch pin.

4,482,167

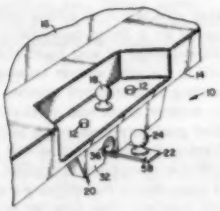
RETRACTABLE HITCH

Harvey L. Haugrud, Rte. 2, Box 16, Lake Park, Minn. 56554

Filed Apr. 11, 1983, Ser. No. 483,671

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—491 B **6 Claims**



1. A hitch, comprising:

a frame;

a tow bar pivotally attached to said frame;

first means, attached to said frame, for stopping pivotal movement in a first direction of said tow bar;

second means, attached to said frame, for stopping pivotal movement in a second direction of said tow bar; and

means for locking said tow bar against one of said first and second stopping means, said locking means including a handle, said handle being rotatable about first and second orthogonal axes to one of lock and unlock said locking means;

said frame including first and second partial enclosures, said first stopping means including a ball attached near an end of said tow bar and a first wall forming one side of said first partial enclosure, said ball moving into said first partial enclosure and contacting said first wall to stop pivotal movement of said tow bar in the first direction, said second stopping means including a second wall forming one side of said second partial enclosure, said tow bar moving into said second partial enclosure and contacting said second wall to stop pivotal movement of said tow bar in the second direction;

whereby said tow bar is rotatable between first and second positions on operation of said locking means with said handle.

4,482,168

SAFETY SKI BINDING

Gerhard Oberleitner, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

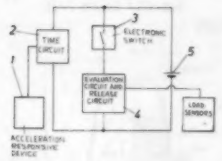
Filed Mar. 8, 1982, Ser. No. 355,290

Claims priority, application Austria, Mar. 10, 1981, 1110/81

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—612 **15 Claims**

1. A safety ski binding adapted to be mounted on a ski, comprising: electrically actuated release means for releasably holding a ski boot on the ski; sensor means for producing electrical signals in response to forces acting on a ski boot releasably held by said release means; control circuit means operatively coupled to said release means and said sensor means and adapted to evaluate said signals from said sensor means for selectively causing said release means to release a ski boot held therein if said signals from said sensor means indicate forces in excess of a predetermined value are acting on the ski boot; an electrical power source; acceleration responsive means which produces an output signal when an acceleration force in excess of a predetermined value acts on said binding; and time circuit means responsive to said acceleration responsive means for supplying electrical operating power from said power source to said control circuit means for a predetermined interval of time in response to said output signal from said acceleration responsive means and for automatically interrupting the supply of electrical power from said power source to said control circuit means at the end of said predetermined interval of time, wherein electrical power is supplied by said time circuit means to said control circuit means only for said predetermined interval of time in response to each said output signal from said acceleration responsive means.



4,482,169

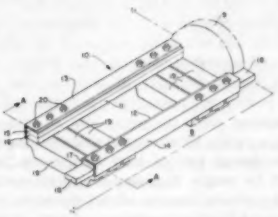
TRACTION RACK FOR LIGHT TRUCKS

George Yim, 950 16th St., Ogden, Utah 84404

Filed Jan. 27, 1983, Ser. No. 461,428

Int. Cl.³ B60S *9/00*

U.S. Cl. 280—759 **2 Claims**



1. A rack configured for placement on the bed of a truck between the rear wheel wells and over the rear axle thereof, for adding weight in a desired distribution to improve traction of the rear wheels of said truck, comprising:

a. first and second transverse elements sized for placement on said bed between said wheel wells;

b. at least one lead weight bolted to respective ends of said transverse elements to form a generally rectangularly-shaped assembly having substantial weight concentrated near the ends of said transverse elements; and

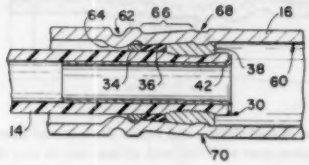
c. said weights configured to support that portion of said transverse elements between the innermost attached weights in a spaced relationship to said bed.

4,482,170

GAS RISER APPARATUS

Irvin D. Jacobson, Bratenahl; Frank R. Volgstadt, and Carl E. Passerell, both of Madison, all of Ohio, assignors to Perfection Corporation, Medina, Ohio

Filed Jul. 1, 1981, Ser. No. 279,617
Int. Cl.³ F16L *9/14*
U.S. Cl. 285—55 **16 Claims**



1. A pipe joint construction comprising:

(a). a conduit assembly including:

a conduit having a first end and a second end;

an annular collar affixed to the exterior of the conduit adjacent its first end;

a resilient seal frictionally engaging the exterior surface of the conduit adjacent the annular collar; and,

a retaining ring slidably disposed on the exterior surface of the conduit with a first side of the retaining ring adjacent the resilient seal;

(b). a tubular element defining:

an internal bore in which the first end of the conduit is disposed;

a stop projecting onto the internal bore, a second side of the retaining ring abutting the stop to prevent movement of the retaining ring therepast, the conduit being slidably received past the stop; and,

an elongated, frustro-conical tapered portion projecting frustro-conically into the internal bore displaced from the stop, the tapered portion projecting into the bore a greater distance at an end toward the stop projection than at an end away from the stop projection, the conduit being slidably receivable past the tapered portion, the resilient seal engaging the retaining ring and the tapered portion; and,

(c). means for anchoring the annular collar in a fixed relationship relative to the tubular element, the annular collar abutting the resilient seal, the annular collar and the retaining ring compressing the resilient seal therebetween into continuing abutment with the tapered portion, whereby under uneven thermal elongation and contraction between the conduit and the tubular element, the resilient seal remains compressed as the conduit slides relative to the retaining ring and the tubular element.

4,482,171

PIPE STRESS/STRAIN NEUTRALIZERS

Joseph K. Campbell, 215-52nd St., Delta, British Columbia, Canada (V4M 2Y3)

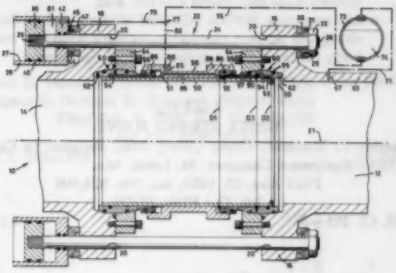
Continuation-in-part of Ser. No. 6,439, Jan. 25, 1979, Pat. No. 4,317,586. This application Feb. 2, 1982, Ser. No. 345,063
Int. Cl.³ F16L *27/00*
U.S. Cl. 285—95 **8 Claims**

1. A pipe joint between a first pipe end and a second pipe end, the pipe joint comprising:

telescoping means allowing the ends to move axially with respect to each other while maintaining fluid-tight communication between them,

a plurality of contraction units located exteriorly of the pipe ends and telescoping means, each contraction unit including a rod member having one end engaged with a first flange member fixed with respect to the first pipe end, the other end of the rod member being secured to a piston riding in a cylinder having a cylinder bottom, the cylinder being engaged with a second flange member fixed with respect to the second pipe end, the cylinder bottom lying between the piston and the said one end of the rod member, the cylinder being displaced axially away from the telescoping means,

and fluid conduit means connecting the interior of one of the pipe ends with the cylinder volume lying between said piston and said cylinder bottom, whereby the pressure inside said cylinder volume is a function of the pressure inside said one of the pipe ends,



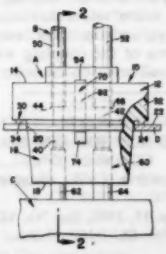
said one end of each rod member having affixed to it a first spherical bearing riding in a first spherical seat supported by the first flange member on the side thereof remote from the telescoping means, said cylinder bottom having affixed to it a second spherical bearing riding in a second spherical seat supported by the second flange member on the side thereof remote from the telescoping means, whereby the entire cylinder lies on the side of the second flange member which is remote from the telescoping means, and whereby the pipe ends have some freedom to rotate with respect to each other.

4,482,172

DUAL SEALING FLUID CONNECTOR

Dennis DeVera, Mundelein, and Nicholas Tzoumis, Roselle, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 9, 1981, Ser. No. 281,825
Int. Cl.³ F16L *39/00, 5/00*
U.S. Cl. 285—137 R **16 Claims**



1. A pneumatic control connector which is connected with at least one pneumatic control line and which is securely mountable through a panel aperture for later connection with a pneumatic control device, the connector comprising:

a resilient body having at least one enlarged fluid conveying bore extending generally axially therethrough, the bore being pneumatically connected with the pneumatic control line at a first end of the resilient body and being

adapted for frictionally receiving nipples of the pneumatic control device at a second end;

the resilient body having a sealing projection extending peripherally therearound surrounding the panel aperture for engaging a first side of the panel;

the resilient body defining at least a first slot extending generally axially, the first slot being disposed inward from the sealing projection; and

a panel mounting means including:

a first elongated portion extending along the first slot,

an anchoring portion connected adjacent a first end of the first elongated portion for abutting the resilient body to restrict axial movement thereof, and,

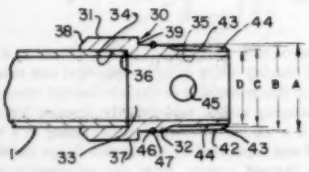
a first engaging portion adjacent another end of the first elongated portion extending outward from the resilient body for engaging a second side of the panel.

4,482,173

DRILL STRING JOINT

Charles L. Rassieur, Creve Coeur, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.

Filed Aug. 22, 1983, Ser. No. 524,908
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—330 **1 Claim**



1. A hollow stem auger having a slip joint intermediate its length comprising a hollow, female member with a smooth cylindrical outer surface and a socket section at one end of said female member, said socket section having a smooth inner wall surface defining a socket with an open mouth at a free outer end, and a male member with a seat section with a smooth cylindrical outer surface and a coupling part having a smooth outer wall surface defining a shape complementary to the socket of the female member, the wall defining said socket diverging axially outwardly to its mouth, and the wall defining the male part's shape converging toward its free end substantially complementarily to the wall defining the socket, said socket and coupling being conical, an O-ring seat extending around the inner wall of one of the coupling and socket and an O-ring seated therein, one of said socket and coupling carrying axially extending keys, and the other, complementary keyways, the convergence of the coupling wall and the divergence of the socket wall being on the order of 0.5° to 1.5°.

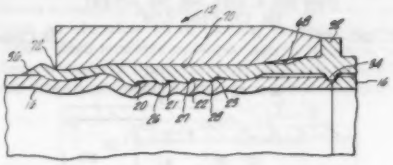
4,482,174

APPARATUS AND METHOD FOR MAKING A TUBE CONNECTION

Vijay K. Puri, Chatsworth, Calif., assignor to Lokring, Los Angeles, Calif.

Filed Sep. 15, 1980, Ser. No. 187,438
Int. Cl.³ F16L *13/14*
U.S. Cl. 285—382.2 **14 Claims**

1. An apparatus for making a tube connection comprising a sleeve having a first end, a center portion and a second end; at least said first end having a substantially constant radius annular chamber adapted to receive a tube section snugly therein and a reverse taper exterior whose exterior radius reduces generally from a maximum near said first end to a lesser amount near said center portion; and lockring means having an interior radius less than the greatest exterior radius of said first end of said sleeve for engaging and deforming the material of said sleeve in the area of said annular chamber, and concomitantly deforming the tube section inserted therein, upon being forced longitudinally along and about the sleeve exterior from said first end to said center portion, such that the resultant



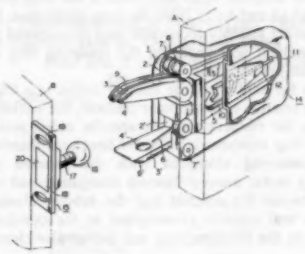
deformation of said sleeve, and hence the inserted tube section, will be greatest near said first end of said sleeve and thereafter generally reducing toward said center portion to produce a reverse taper deformation of said sleeve chamber and hence of the tube section inserted therein.

4,482,175

LOCKING DEVICES

Syuichi Sugie, Tokyo, Japan, assignor to Kabushiki Kaisha Isshin Kenkyusho and Tokyo Magnet Ohyo Seihin Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 464,021
Int. Cl.³ E05C *19/02*
U.S. Cl. 292—45 **4 Claims**

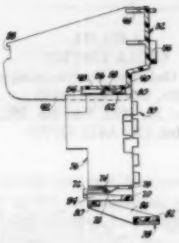


1. A locking device for opening or closing a door, comprising a lock housing having an inlet and an outlet on a front side thereof, and grooves having a substantially heart-shaped contour which are formed on respective outer surfaces of said lock housing to communicate with said inlet and said outlet and which gradually increase in depth from an inlet end to an outlet end thereof; and a key unit on which is pivotally mounted a forked hook which has a spring force to urge branches thereof inward and a spring force to keep said forked hook in parallel with an axis thereof, said lock housing and said key unit being mounted on a box and said door to oppose each other, said forked hook being moved into said grooves through said inlet when said door is closed and then being stopped in a recess formed in said heart-shaped contour to lock said door, engagement of said forked hook in said recess being released when said door is opened so that said forked hook can be moved out through said outlet.

4,482,176
MANUALLY OPERABLE LATCH FOR HINGED PULL-DOWN MEMBER

Frederick H. Rider, Jr., Youngstown, and Joseph O. List, Cortland, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1982, Ser. No. 404,563
Int. Cl.³ E05C *19/06*
U.S. Cl. 292—87 **2 Claims**

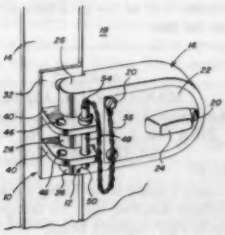


1. A manually operable latch for a hinged pull-down member, comprising;
- a generally flat body having relatively rigid ways at the opposite ends thereof for attaching the latch to the pull-down member,
- a pair of flex arms, each having an end integrally attached to the body,
- a latch bar integrally attached to the respective opposite ends of the flex arms,
- a pair of rigid spars, each having an end integrally attached to the latch bar,
- a handle integrally attached to the respective opposite ends of the rigid spars whereby the flex arms are curled and the latch bar moves away from the body responsive to movement of the handle toward the body, and
- an elongated latch arm for retaining the latch arm on the pull-down member, said latch arm having its opposite ends integrally connected to the respective relatively rigid ways so that the latch arm is isolated from any torsional effects on the body produced by operation of the handle to curl the flex arms and move the latch bar away from the body.

4,482,177
STRIKER PLATE AND SECURITY PIN FOR DEAD BOLT LOCK

David L. Nagy, Chicago, Ill., assignor to Daniel F. Domenjoud, Chicago, Ill., a part interest

Filed Sep. 23, 1982, Ser. No. 425,045
Int. Cl.³ E05C *1/16*
U.S. Cl. 292—156 **7 Claims**

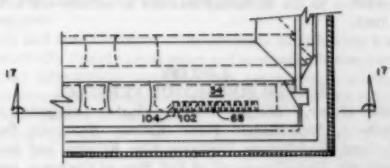


1. A strike plate and security pin for a dead bolt lock of the type including a vertically reciprocal inch bolt, said strike plate including a projecting lug having an aperture adapted to receive the lock bolt when extended into locking position for use in retaining a door in closed position, that improvement comprising the lug having an extending area having an aperture therein adapted to be disposed in the path of the portion of the lock having the lock bolt associated therewith, and a security pin extending through the aperture in the extending area of the lug on the strike plate to prevent movement of the lock even when the lock bolt is retracted, the lock including a pair of lock bolts, the strike plate including a pair of lugs each having an aperture for receiving a lock bolt, each of said lugs including an extending area each having an aperture therein receiving the security pin.

4,482,178
STORM WINDOW LOCK

Norman G. Damiana, 13320 Winfield Pl., Golden, Colo. 80401, assignor to Norman G. Damiana, Denver, Colo.

Filed Feb. 6, 1981, Ser. No. 232,119
Int. Cl.³ E05C *1/10*
U.S. Cl. 292—175 **1 Claim**



1. A lock for a window having a positionable window portion, said positionable window portion being slideably mounted in a generally rectangular window casing, said window casing constructed from four generally linear members formed in a generally rectangular configuration comprising in combination:
- track means formed in two parallel side linear members of said window casing for sliding said positionable window along a predetermined path in said window casing;
- latch means mounted on said positionable window, said latch means for selectively engaging said window casing; and
- at least one generally L-shaped keeper having a generally vertically oriented locking arm and a horizontal arm, said keeper providing connection means for two of said generally linear members of said storm window casing intersecting at a corner of said storm window casing, said keeper further having a ramp portion adapted to engage and retract said latch means and a recess portion positioned along said locking arm for retaining said latch means.

4,482,179
DOOR HANDLE ASSEMBLY

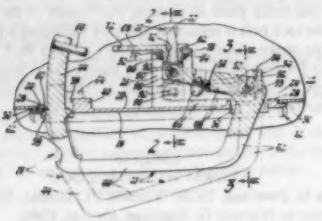
James J. Johnson, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 15, 1982, Ser. No. 450,051
Int. Cl.³ E05C *21/00*
U.S. Cl. 292—336.3 **2 Claims**

1. An operating handle assembly for actuating the latch of a vehicle door or the like, comprising,
- a mounting member adapted to be attached to the vehicle door,
- linearly movable actuating means associated with the mounting member,
- a linearly movable camming member including a helical twist,
- a latch release lever rotatably mounted to the mounting member so as to be able to actuate the vehicle door latch, the release lever having a camming opening which re-

ceives the camming member therethrough and has a cross-section matching the cross-section of the camming member,

means operatively connecting the camming member to the actuating means,



linear movement of the camming member by the actuating means moving the camming member linearly through the camming opening and rotating the latch release lever relative to the mounting member to actuate the vehicle latch.

4,482,180

BUMPER FOR MOTOR VEHICLES

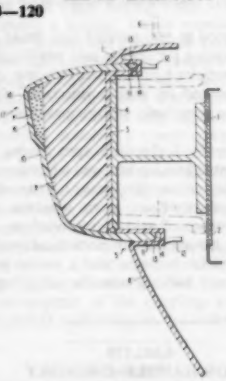
Guntram Huber, Aidlingen; Wolfgang Fischer, Leinfelden; Fritz Haeberle, Sindelfingen; Horst Kleiner, Stuttgart; Daniel Riechers, Sindelfingen; Wolfgang Klie, Korntal, and Johann Tomforde, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,885

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125687

Int. Cl.³ B60R *19/08*

U.S. Cl. 293—120 **14 Claims**



1. A bumper arrangement for motor vehicles comprising support means being adapted to abut at least one integral part of a vehicle, energy absorber means associated with the support means for absorbing forces impacting thereon, shell means of a viscoelastic material fixed relative to and for at least partially surrounding the energy absorber means a front side of the support means being made essentially flat, cover means including a middle segment disposed proximate the front side of the support means and guide groove means for cooperating with the shell means, the cover means including a skirt segment extending in a downward direction and an upper segment, the skirt segment and upper segment adjoining the middle segment and formed integrally therewith, said guide groove means formed in a transitional area between the upper segment and middle segment and in a transitional area between the skirt segment and middle segment for receiving ends of the shell means therein, each guide groove means opening in a direction facilitating the receipt therein of a respective end of the shell means, opening means provided in each of the guide groove means for cooperatively receiving a locking means therethrough, locking means extending from the shell means for securing the shell means to the cover means by being cooperatively received by an opening means.

4,482,181

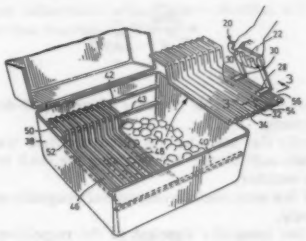
GRILL LIFTER

Charles G. Shepherd, Oakville, Canada, assignor to B. D. Wait Co. Limited, Oakville, Ontario, Canada

Filed Apr. 28, 1981, Ser. No. 258,255

Int. Cl.³ A47J *45/10*

U.S. Cl. 294—12 **4 Claims**



2. A lifter for use in manipulating a grill used on a barbeque, the lifter comprising:

a pair of aligned hooked portions adapted to pass between a pair of adjacent bars and to engage under one of the bars of the grill; a handle being located generally between and spaced from the aligned hooked portions;

a pair of generally parallel legs extending from respective ends of the handle; and

a pair of reaction portions extending between rspective legs and associated ones of the hooked portions, each reaction portion being spaced in a different plane from the hooked portion by the thickness of the grill bars for engagement with at least one further bar spaced from said adjacent bars, the reaction portions having a length at least twice the distance between adjacent grill bars,

the handle, the hooked portions and the reaction portions being arranged in a fixed relationship relative to one another, the hooked portions and the handle lying generally in a plane perpendicular to a second plane containing the reaction portion such that the lifter can be used to move the grill while maintaining the grill in a generally horizontal position with the reaction portions in engagement with said further bar or bars, and such that the lifter can be used to lift the grill by an outermost one of the grill bars with the grill hanging freely from the lifter.

4,482,182

MANHOLE LID LIFTER

James W. Mortensen, 2147 S. 79th St., West Allis, Wis. 53219

Filed Feb. 2, 1983, Ser. No. 463,170

Int. Cl.³ B66F *11/00*

U.S. Cl. 294—15 **5 Claims**

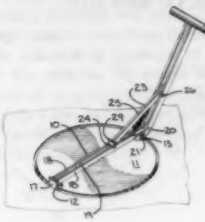
1. A tool which is suitable for lifting a manhole lid which has spaced attachment notches, the tool comprising:

a substantially rigid support beam;

said beam having a first hook adjacent to its forward end which is adapted to be inserted in one of the notches;

said beam also having a pivot attachment point adjacent the rear end of the beam;

a second hook mounted on the pivot attachment point, said second hook being adapted to be inserted in a second of said notches upon a pivoting of the hook relative to the beam, said hooks then acting to grip the lid between them; and



a catch means which prevents the second hook from pivoting back out of the second notch until the catch is released, said catch means automatically activating and locking the second hook in the second notch upon a pivotal movement of the second hook into the second notch.

4,482,183

WIND DEFLECTOR DEVICE AT AN AUTOMOBILE ROOF

Rainer Grimm, Wetzlar, and Rudolf Roos, Maintal, both of Fed. Rep. of Germany, assignors to Rockwell Golde GmbH, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,332

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137191

Int. Cl.³ B60J *7/22*

U.S. Cl. 296—217 **15 Claims**

1. In a wind deflector device at an automobile roof comprising a roof opening surrounded by a roof frame, which opening can be closed by a sliding lid guided laterally on guide rails of the roof frame, consisting essentially of a wind deflector disposed pivotally along the forward edge of the roof opening and of two restoring levers, which are each pivotally journalled at one end laterally on the roof frame and engage with the other end into an elongated hole situated on the wind deflector, wherein the wind deflector can be pivoted outwardly by spring force when the sliding lid is opened and can be pivoted inwardly when said sliding lid is moved into the closed position the improvement comprising a pivoting spring, bearing against the roof frame, said spring preloading each said restoring lever, at least one displacement spring being operatively connected to said wind deflector, said displacement spring applying a preloading force against the forward portion of said roof frame whereby said wind deflector will swing out and be displaced simultaneously until the forward edge of said wind deflector bears against the forward edge of the opening in said roof, said pivoting springs being each formed as a spring arm, displaceably bearing at one end against said the other end of said restoring lever and fixed at its other end to said roof frame.

4,482,184

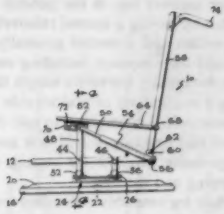
PORTABLE FOLDING CHAIR

Christopher D. Mincey, 6811 E. Ocean Blvd., Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 338,089, Jan. 8, 1982, abandoned. This application Sep. 17, 1982, Ser. No. 419,139

Int. Cl.³ A47C *4/00*

U.S. Cl. 297—28 **9 Claims**



1. A portable folding chair comprising:

a support;

front and rear U-shaped chair supports each having a substantially straight cross piece and upwardly directed arms, said substantially straight cross pieces being pivotably mounted on said support and pivoting on an axis substantially parallel to each other;

left and right seat rails each pivoted to one upwardly extending arm of each of said front and rear U-shaped chair supports so that said support, said chair supports and said seat rails substantially form a pivoting parallelogram;

an arm support extending upward from said front chair support and firmly connected thereto;

inner and outer telescoping members, one of said telescoping members being pivoted to said arm support and the other of said telescoping members being pivoted to the seat rail on the same side of said chair, said telescoping members being of such length as to permit said arm supports to pivot forward to close the parallelogram in the forward, folded direction and to stop motion of the parallelogram in the chair-erected position wherein said seat rails are spaced away from said support.

4,482,185

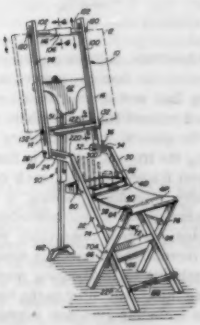
CONVERTIBLE EASEL

Philip Zoellner, 10429 Campana Dr., Sun City, Ariz. 85351

Filed Jan. 31, 1983, Ser. No. 462,536

Int. Cl.³ A47B *97/04*

U.S. Cl. 297—135 **16 Claims**



1. A convertible easel having a clamp assembly that generally defines a rectangular frame of adjustable length whereon a work piece may be positionably retained, comprising:

a first frame support leg in the general shape of an L-shaped bellcrank having a first relatively straight elongated leg portion and a first generally horizontal leg extension, said leg extension including an elongated slot therein, said slot extending substantially the entire length of said extension leg, for defining a multiplicity of positionable locations along said elongated leg slot for operably coupling said first frame support leg to said clamp assembly through said elongated slot extension;

a second frame support leg, in the general shape of an L-shaped bellcrank having a second relatively straight elongated leg portion and a second generally horizontal leg extension, said leg extension including an elongated slot extending substantially the entire length thereof, said slot for defining a multiplicity of positionable locations along said leg extension for connection to said clamp assembly, the proximal end portions of said first and second frame support legs being adapted for resting on the ground without slipping and the like;

a first camp chair leg rotatably connected near its mid point to the corresponding distal end portion of said first frame support leg;

a second camp chair leg rotatably connected near its mid point to the corresponding portion of said second frame support leg; and

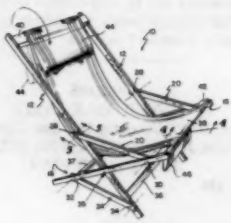
a foldable seat having first and second ends connected to said first and second camp chair legs and to said frame support legs, respectively.

4,482,186

JOINTED ARTICLE OF FURNITURE

Daniel Gomes, Bloomington, Ind., assignor to Abra Inc., Bloomington, Ind.

Filed Apr. 26, 1982, Ser. No. 371,604
Int. Cl.³ A47C *4/30, 7/62*; F16C *11/04*
U.S. Cl. 297—441 **15 Claims**



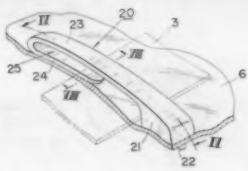
1. An article of furniture, comprising frame members, a seat member supported on the frame members, a pivotal joint for pivotally coupling first and second frame members to each other, the first and second frame members each including a truncated bore, the pivotal joint including two connecting means for engaging the truncated bores in fixed relationship to the first and second frame members, each connecting means including an axially extending opening, a bearing member received in the openings of the two connecting means, retaining means engaging the two connecting means to prevent lateral separation thereof, the connecting means being independently rotatable relative to the bearing member, attachment means for attaching the seat member to the frame members, the attachment means including two seat support members connected to the frame members, each support member including an elongated slot for receiving an end of the seat member, each slot including a shoulder, and a rod removably coupled to the end of the seat member for seating on the shoulder in the slot.

4,482,187

BELT GUIDE STRUCTURE

Hideyuki Nagashima, and Hiroo Okuyama, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jun. 2, 1982, Ser. No. 384,676
Claims priority, application Japan, Jun. 12, 1981, 56-85475[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 297—468 **16 Claims**



1. A belt guide structure for guiding a safety belt of a width suitable to restrain a passenger on a vehicle seat, comprising:

a base plate; and

a belt guide including:

a root portion secured on said base plate; and

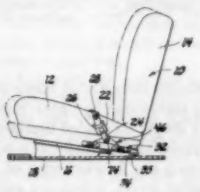
an arm portion extending from said root portion to form a guide space for receiving said safety belt between said arm portion and said base plate, said arm portion having at its free end an inturned tongue turning toward said root portion, said inturned tongue being maintained in contact with said base plate so as to permit entrance of said safety belt into said guide space under a force to cause said inturned tongue to lift off said base plate but prevent said safety belt from lifting said inturned tongue off said base plate to escape from said guide space.

4,482,188

ANCHORAGE FOR A SEAT MOUNTED SEAT BELT

Thomas Tilly, Fair Haven, and Lloyd W. Rogers, Jr., Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1982, Ser. No. 445,910
Int. Cl.³ A62B *35/00*; A47C *31/00*
U.S. Cl. 297—473 **3 Claims**



1. In combination with a longitudinally adjustable vehicle seat mounted on a vehicle floor, a seat belt anchorage comprising:

a member connected to the vehicle floor and having walls extending along the path of longitudinal seat adjusting movement;

first and second wedge members normally longitudinally slidable relative the walls of the member and having associated ramp means by which movement of the wedge members toward one another moves the wedge members into locking engagement with the walls of the member to thereby lock the wedge members against longitudinal movement relative the walls of the member;

means operatively connecting the seat belt with one of the wedge members so that an occupant restraint load imposed upon the seat belt induces longitudinal movement of the one wedge member toward the other to move the

wedge members into locking engagement with the walls of the member whereby the seat belt is fixed relative to the member and the occupant restraint load is transmitted through the member to the vehicle floor; and

means operatively connecting the seat with both the first and second wedge members so that adjusting movement of the seat in either direction will move one of the wedge members longitudinally away from the other wedge member to establish non-locking positions of the wedge members relative the member to enable longitudinal adjusting movement of the wedge members and the seat belt so that the seat belt is always carried at a selected position relative to the vehicle seat notwithstanding adjustment of the seat relative the vehicle floor.

4,482,189

CAST VEHICLE WHEEL

Michael A. Samuelson, and James H. Dick, both of Melbourne, Australia, assignors to General Motors-Holden's Limited, Victoria, Australia

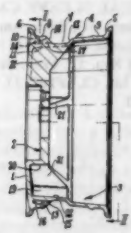
PCT No. PCT/AU81/00064, § 371 Date Jan. 12, 1982, § 102(e) Date Jan. 12, 1982, PCT Pub. No. WO81/03465, PCT Pub. Date Dec. 10, 1981

PCT Filed May 26, 1981, Ser. No. 341,985

Claims priority, application Australia, May 26, 1980, PE3731

Int. Cl.³ B60B *3/02*

U.S. Cl. 301—6 CS **3 Claims**



1. A cast vehicle wheel including, a hub member, an imperforate annular disc section surrounding and formed integral with said hub member, a generally cylindrical rim member formed integral with said disc section and located radially outwardly of said hub member, said rim member being stepped between its axial ends to form a well section of reduced diameter, a tire retaining flange at each axial end of said rim member, one said retaining flange surrounding and being contiguous with said disc section, a substantially cylindrical tire bead seating wall formed integral with said one retaining flange and extending therefrom towards the other said retaining flange, said bead seating wall overlying and being spaced radially outwards of a surface of the rim member which is contiguous with the base of said well section, a terminal edge of said bead seating wall being located adjacent said well section, a plurality of circumferentially spaced webs provided in the space between said bead seating wall and the surface which it overlies, and an end edge of each said web being contiguous with said terminal edge of the bead seating wall and sloping downwardly and away from that terminal edge.

4,482,190

MULTIPLE-CIRCUIT HYDRAULIC BRAKE SYSTEM

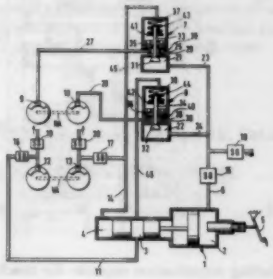
Jochen Burgdorf, Offenbach-Rumpenheim, and Alfred Birkenbach, Hattersheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sep. 20, 1982, Ser. No. 419,882

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150218

Int. Cl.³ B60T *8/02, 11/24*

U.S. Cl. 303—6 R **27 Claims**



1. A multiple-circuit hydraulic brake booster system for an automotive vehicle comprising:

a brake-actuating device for the actuation of wheel brake cylinders including three working chambers adapted to be pressurized;

a first brake circuit coupled to a first of said three working chambers;

a second brake circuit coupled between a second of said three working chambers and one wheel brake cylinder of a front axle of said vehicle;

a third brake circuit coupled between a third of said three working chambers and the other wheel brake cylinder of said front axle;

a first control valve coupled in said first brake circuit between said first of said three working chambers and one wheel brake cylinder of a rear axle of said vehicle diagonally opposite said one wheel brake cylinder of said front axle, said first control valve being coupled to said second of said three working chambers and under control of pressure therein to retain pressure in said one wheel brake cylinder of said rear axle below a wheel locking limit upon failure of said second brake circuit; and

a second control valve coupled in said first brake circuit between said first of said three working chambers and the other wheel brake cylinder of said rear axle diagonally opposite said other wheel brake cylinder of said front axle, said second control valve being coupled to said third of said three working chambers and under control of pressure therein to retain pressure in said other wheel brake cylinder of said rear axle below said wheel locking limit upon failure of said third brake circuit.

4,482,191

DUAL CIRCUIT BRAKE VALVE

Siegfried Beck; Jürgen Holfelder, both of Stuttgart; Steffen Straub, Vaihingen, and Aloys Schnäker, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,487

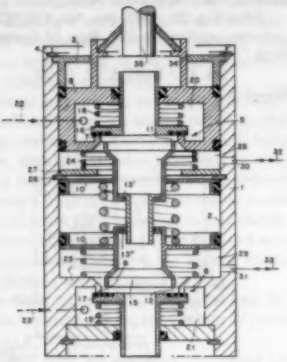
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130759; Mar. 3, 1982, 3207618

Int. Cl.³ B60T *15/06*

U.S. Cl. 303—52 **5 Claims**

1. A dual circuit brake valve for a brake system of a motor vehicle comprising a housing, said brake valve having two

individual valves disposed one after the other in said valve housing, each of said individual valves including an inlet valve seat and a piston including an outlet valve seat, a control and repercussion piston for operating said individual valves, further including an actuation member for mechanical actuation of at least one of said two individual valves, characterized in that a pressure-limiting spring is inserted between said pistons of said two individual valves for the purpose of pressure limitation between said two valves.



4,482,192

ANTI-SKID BRAKING APPARATUS

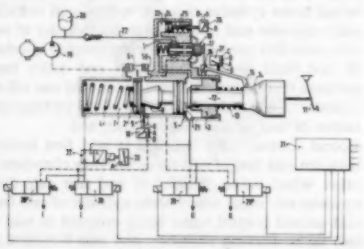
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 6, 1982, Ser. No. 395,764

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151292

Int. Cl.[3] **B60T** *8/02*

U.S. Cl. 303—100 **9 Claims**



1. An anti-skid braking apparatus having a multiple-circuit brake force amplifier and wheel brake cylinders supplied thereby, said apparatus further including anti-skid valves disposed between said brake force amplifier and said wheel brake cylinders, said anti-skid valves being triggerable via an electronic switching device, characterized in that there is disposed in at least one brake circuit (I or II) an additional 3/2-way magnetic valve, which is triggerable via the electronic switching device by means of switching signals derived from the status of said brake amplifier at a particularly time via appropriate switching means, and said 3/2-way magnetic valve further including an electric-current-actuated switching position in which a supply-effecting connection can be established between said other brake circuit (II or I, respectively) and the first brake circuit (I or II).

4,482,193

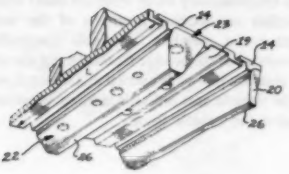
ROADABLE TRACK ASSEMBLY

Roger L. Boggs, and Andrew J. Tonsor, both of East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 11, 1983, Ser. No. 483,963

Int. Cl.[3] **B62D** *55/28*

U.S. Cl. 305—51 **13 Claims**



1. An endless roadable track assembly (**12**) for a track-type vehicle (**10**), comprising:

a plurality of track shoes (**14**), each shoe (**14**) having a length (L) and a ground contacting surface (**19**);

a plurality of grouser bars (**20**) formed of elastomeric material, one of said grouser bars (**20**) secured to each of the ground contacting surfaces (**19**) of said shoes (**14**);

each grouser bar (**20**) having a height (h), and a length (L_1) substantially equal to the length (L) of said shoe (**14**); and,

each of said grouser bars (**20**) being equally spaced a predetermined distance (D) from the next adjacent grouser bar (**20**) with the ratio of said grouser bar height (h) to said preselected distance (D) being in the range of from 0.15 to 0.35.

4,482,194

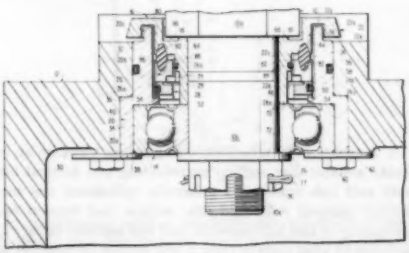
FLUID PRESSURE ASSISTED ROTARY SHAFT SEAL WITH LABYRINTH BUSHING AND REPLACEMENT SEAL SLEEVE CARTRIDGE

Joseph W. Chambers, Sr., Santa Ana, Calif., assignor to Disposable Waste Systems, Inc., Santa Ana, Calif.

Filed Sep. 12, 1983, Ser. No. 531,523

Int. Cl.[3] **F16C** *33/78, 33/80*

U.S. Cl. 384—480 **9 Claims**



1. In a fluid pressure assisted rotary shaft seal assembly for sealing a shaft supported for rotation about its axis within a housing bore by an anti-friction bearing interposed between the shaft and the housing bore, said bearing having an outer bearing race fixed to the housing and an inner bearing race fixed to the shaft and rotating therewith, said seal assembly comprising:

an annular bushing operatively fixed to said shaft adjacent the anti-friction bearing on the high pressure side of the housing, an annular static seal race operatively fixed to said housing and having axially opposed end faces, an annular rotating seal race operatively coupled to said shaft and having an end face sealably engageable with one

opposing end face of said static seal race, the improvement comprising:

a replaceable wear sleeve cartridge fixedly mounted to said housing bore, being concentric to said annular bushing over at least a portion of its length and spaced therefrom to define an annular cavity therebetween to the side of said anti-friction bearing,

said static seal race being mounted within said cavity and rotatably fixed to said replaceable wear sleeve cartridge,

means resiliently compressibly coupling said rotating seal race to said bushing within said cavity for rotation therewith,

means including said bushing and said cartridge defining a labyrinth preseal exterior of said casing, and

means including said replaceable wear sleeve cartridge, said annular bushing and said seal races defining a positive fluid pressure seal internally of said cavity for preventing any exterior fluid medium from penetrating the interior of the casing through said assembly.

4,482,195

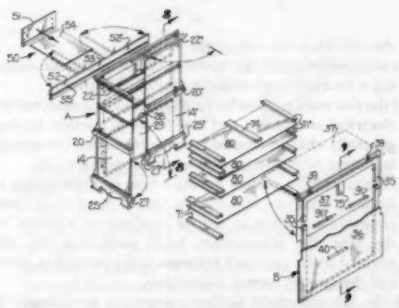
ARTICLE OF FURNITURE

Richard M. Chapin, Rte. 6, Box 668, Mooresville, N.C. 28115

Filed Aug. 11, 1983, Ser. No. 522,006

Int. Cl.³ A47B *43/00*

U.S. Cl. 312—210 **4 Claims**



1. A compact readily assemblable knock-down article of furniture adapted to be assembled into a rigid caselike condition and comprising first and second major components folded into a compact knock-down condition for storage and shipment and being quickly and easily erected and permanently assembled when ready for use,

(a) said first major component of said furniture article including

(1) a rectangular front panel including top, bottom and opposed side edges;

(2) a pair of rectangular end panels including top, bottom, and front and rear opposed side edges, and

(3) first hinge means pivotally connecting corresponding front side edges of each of said end panels to corresponding side edges of said front panel so that said end panels may be positioned in an inwardly folded compact position parallel to said front panel when in knock-down form, and so that said end panels may be unfolded to a position at right angles to said front panel in preparation for assembly, said first hinge means being hidden from frontal and side view when said end panels are in unfolded position, and

(b) said second major component of said furniture article including

(1) a rectangular rear panel including top, bottom and opposed side edges,

(2) a rectangular top panel including front, rear and opposed side edges,

(3) second hinge means pivotally connecting said rear side edge of said top panel to said top side edge of said rear panel so that said top panel may be positioned in an inwardly folded compact position against said rear panel when in knock-down form, and so that said top panel may be unfolded to a position at right angles to said rear panel in preparation for assembly, said second hinge means being hidden from frontal and side view when said top panel is in unfolded position, and

(4) means for connecting opposite side edges of said rear panel with the corresponding rear side edges of the unfolded end panels, and for connecting said front side edge of the unfolded top panel with said top side edge of said front panel to thereby enable assembly of said first and second components into a rigid caselike condition with all hinge means being hidden from view.

4,482,196

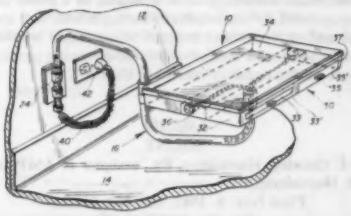
APPLIANCE CADDY

John Wolens, 1000 N. Lake Shore Dr., Apt. 4B, Chicago, Ill. 60611

Filed Apr. 25, 1983, Ser. No. 488,202

Int. Cl.³ H01R *35/00*; A47B *11/00*

U.S. Cl. 339—2 R **5 Claims**



1. An apparatus for supporting small appliances comprising:

a cantilever arm having a base portion adapted for pivotal movement when mounted to a support structure, and an end portion pivotally connected to said base portion;

a platform rotatably mounted to the end portion of said cantilever arm and including at least one electrical receptacle;

an electrical conductor housed within said cantilever arm, one end of said conductor terminating at said receptacle and the other end extending from the base portion of the cantilever arm and terminating in an electrical plug; and

means for limiting the rotation of said platform on said cantilever arm to less than 360°.

4,482,197

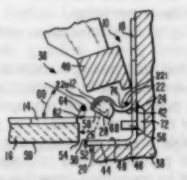
LOW-INSERTION FORCE SOLDER-BEARING LEAD

Paul J. Ouellette, Amesbury, Mass., and Vincent F. Riviezzo, Salem, N.H., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,723

Int. Cl.³ H01R *4/02*

U.S. Cl. 339—17 C **10 Claims**



1. A low-insertion force solder-bearing lead, which comprises:

an elongated stem;

first and second resilient clamping fingers having respective substrate clamping portions extending from the elongated stem in opposed relationship for the reception of a substrate therebetween, the first substrate clamping portion of the first clamping finger having an inner planar surface for engaging an opposed planar surface of the substrate in parallel mating relationship when the substrate is inserted into the gap between the substrate clamping portions;

a solder preform mounted on the second substrate clamping portion and having at least one noncircular surface portion disposed in generally opposed relationship to the first substrate clamping portion;

the second substrate clamping portion being wrapped about a portion of the solder preform in clamping relationship and including a noncircular outer end portion disposed adjacent the noncircular surface portion of the solder preform; and

the noncircular outer end portion of the second substrate clamping portion being formed into the solder preform such that a noncircular surface portion of the outer end portion is essentially flush with the noncircular surface portion of the solder preform, and such that the noncircular surface portion of the outer end portion and the noncircular surface portion of the solder preform define an outer noncircular camming surface which, at a point of initial engagement by the substrate during a lead and substrate assembling operation, extends at an angle to the inner planar surface of the first substrate clamping portion at an angle on the order of not more than 45°.

4,482,198

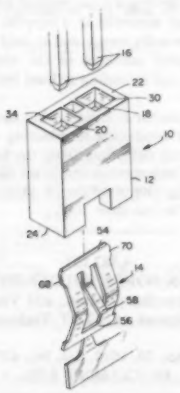
SHUNT

Daniel J. Crowley, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 8, 1982, Ser. No. 440,110

Int. Cl.³ H01R *31/08*

U.S. Cl. 339—19 **4 Claims**



1. A shunt connector comprising:

an integral housing of rigid insulative material having an overall rectangular profile defining therein a pair of closely spaced terminal passages extending from a front mating face to an oppositely directed rear face, a slot interconnecting portions of said passages and defining a lug intermediate the passages; and

a terminal receivable in said housing, said terminal having first and second parallel spaced contact arms joined at each end thereof by transverse cross bar portions, a latching tine extending from one cross bar to lie intermediate and parallel to the contact arms, said contact arms each having a longitudinal bowed configuration intermediate said cross bar portions, said terminal being mounted in said housing with said cross bar portions engaging one wall, said contact arms lying in respective passages directed toward an opposite wall, and said latching tine engaging said lug,

whereby mating pin terminals can be inserted into said shunt connector from either face without dislodging or damaging said terminal.

4,482,199

ELECTRICAL CONTACT

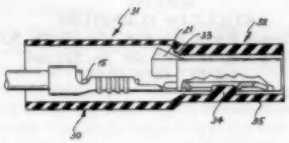
Walter Karl, Lugarno, Australia, assignor to Utilux Pty. Limited, Australia

Filed Mar. 9, 1983, Ser. No. 473,703

Claims priority, application Australia, Mar. 22, 1982, PF3232; Nov. 12, 1982, PF6770

Int. Cl.³ H01R *13/633*

U.S. Cl. 339—74 R **15 Claims**



1. An electrical tab receptacle

(a) which is integrally formed from sheet metal and comprising a forward portion and a rearward portion,

(b) the rearward portion being adapted to be connected to an electrical conductor and the forward portion having a generally channel-shaped receptacle portion for engaging in mating relationship with a complementary tab,

(c) the receptacle portion having a base and upstanding side walls at least one of which is turned in so as to have a connection portion in spaced confronting relation with the base, the arrangement being such that the tab is adapted to be received between said connection portion and the base to form a connection,

(d) the tab receptacle further comprising a resiliently displaceable engagement member extending from a side of the receptacle portion, and a portion of the engagement member extending adjacent said at least one turned-in portion and in a direction towards the base to provide an engagement element positioned, biassed and having means for engaging in latching engagement with a corresponding portion of the complementary tab,

(e) the engagement member having a release portion located outside the channel-shaped receptacle portion and characterised by

(f) the release portion being to the same side of the base as the turned-in portion or portions of the side walls, the release portion being shaped and disposed for receiving a displacement force for moving the engagement element in a direction away from the base to disengage from the complementary tab to permit its removal.

4,482,200

CONNECTOR BOX

James F. Willenborg, Santa Clara, Calif., assignor to INMAC, Santa Clara, Calif.

Filed Jul. 28, 1982, Ser. No. 402,506

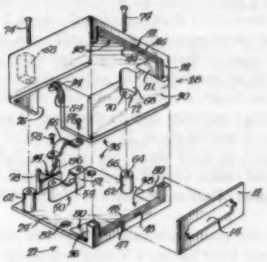
Int. Cl.³ H01R *13/58*

U.S. Cl. 339—103 M **9 Claims**

1. A connector box for retaining a cable having a cable connector fixed on one end at a cable connector junction, which cable and connector may be easily removed from the connector box, the connector box comprising in operative association:

(a) a base adapted to be mounted on a surface to provide support for the connector box;
(b) a first connector plate retaining means on the base;
(c) a cover member removably attached on the base;
(d) a second connector plate retaining means on the cover member; and
(e) a connector plate defining a chosen aperture for receiving the cable connector with the cable connector mounted to the connector plate, the connector plate being associated with the first and second connector plate retaining means;

said first and second connector plate retaining means including a pair of substantially parallel lips defining a channel to receive the connector plate, the channels of both connector plate retaining means being substantially coplanar when the cover member is attached to the base, said first and second connector plate retaining means defining a hole on a first side when the cover member is attached to the base, said channels together



extending substantially around the periphery of the hole;

the base, cover member and both connector plate retaining means defining a box combination having an internal chamber; the box combination on a second side defining a passage of sufficient size to pass the cable through the second side into the chamber and across the base to the connector mounted on the first side, the first and second connector plate retaining means cooperating to removably retain the connector plate in a substantially fixed position with respect to the base whereby one end of the cable is fixed relative to the surface when the connector for the cable is mounted on the connector plate, thus permitting a corresponding complementary connector to be mated with and disconnected from the cable connector without placing undue strain on the cable, the cable and connector being easily removed from the connector box, the connector box then being able to receive another cable with a connector of different configuration.

4,482,201

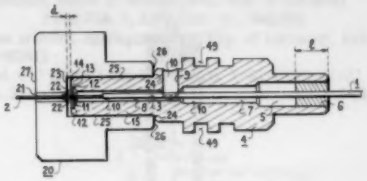
OPTICAL FIBRE CONNECTOR END FITTING, PROCESS FOR CENTERING A FIBRE IN THE END FITTING AND DEVICE FOR PERFORMING THIS PROCESS

René Dousset, Suresnes, France, assignor to Socapex, Suresnes, France

Filed Apr. 5, 1982, Ser. No. 365,333
Claims priority, application France, Apr. 6, 1981, 81 06852
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **11 Claims**

1. An optical fibre connector end fitting comprising:

a cylindrical centering sleeve in which is provided a cylindrical channel permitting the passage of the fibre, said centering sleeve having on its front end a contact face at which the said fibre emerges including a radial cylindrical hole connected to the cylindrical channel, and which further comprises a centering bush located at a rear end portion thereof, the fibre being positioned substantially parallel to the axis of the cylindrical channel in the rear portion of the end fitting via said centering bush and in the



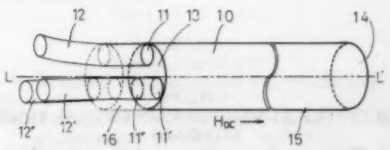
front portion of the sleeve via a polymerized resin introduced through said cylindrical hole prior to polymerization and which holds the fibre in position after polymerization.

4,482,202

OPTICAL GLASS FIBER TRANSMISSION LINES COUPLED JUNCTION CIRCULATORS

Tsukasa Nagao, 2-26-5-6, Hashirimizu, Yokosuka, Japan

Filed Sep. 20, 1982, Ser. No. 419,764
The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.15 **2 Claims**



1. An optical glass-fiber transmission lines coupled junction circulator comprising

a magneto-optic circular cylinder made of magneto-optic material having optical anisotropy under biasing magnetic field to effect magneto-optic Faraday rotation,

said magneto-optic cylinder being arranged in the common axis, and said magneto-optic cylinder being optically shielded,

plural numbers of coupling optical glass-fiber transmission lines, each line being attached to an opening formed on an entry plane surface on said magneto-optic cylinder in rotational symmetry around said common axis,

and means for magnetically biasing said magneto-optic cylinder in the direction parallel to said common axis.

4,482,203

ADJUSTABLE COUPLING DEVICE FOR A FIBER-OPTIC POWER DIVIDER

David W. Stowe, Buffalo Grove, and Paul M. Kopera, Franklin Park, both of Ill., assignors to Gould Inc., Rolling Meadows, Ill.

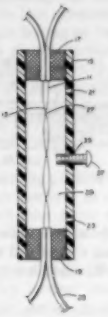
Continuation of Ser. No. 245,291, Mar. 19, 1981,. This application Dec. 21, 1983, Ser. No. 563,545
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.15 **11 Claims**

1. An adjustable evanescent-wave coupling device for optical fibers comprising:

(a) housing means for rigidly encasing longitudinal portions of said optical fibers in close proximity to one another to allow optical evanescent-wave coupling to occur

means for maintaining said portions in a stable pressure

environment including an elastic filler material in said housing means encasing said longitudinal portions; and



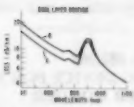
(b) force creating means for repeatably producing transverse forces through said filler material onto a segment of said longitudinal portions to vary the optical coupling characteristics of said fibers.

4,482,204

ULTRAVIOLET ABSORBERS IN OPTICAL FIBER COATINGS

Lee L. Blyler, Jr., Basking Ridge, and Frank V. DiMarcello, Clinton Township, Hunterdon County, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 25, 1980, Ser. No. 123,954
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.34 **18 Claims**



13. A coated optical fiber jacketed so as to operate in a dark environment, wherein said coated optical fiber comprises a coated layer comprising polymer material and photoinitiator material that forms free radicals suitable for promoting polymerization of said polymer material when exposed to ultraviolet radiation, characterized in that said coated layer comprises at least 0.1 weight percent ultraviolet-absorbing material that does not form a substantial amount of free radical which promote polymerization of said polymer material when exposed to ultraviolet radiation.

4,482,205

TEMPERATURE-INSENSITIVE OPTICAL FIBERS

Nicholas Lagakos, Silver Spring, Md., and Joseph A. Bucaro, Herndon, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1982, Ser. No. 432,215
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.34 **13 Claims**

1. An optical fiber with reduced temperature sensitivity which comprises:

a light-propagating core having the factor

$$1/n\left(\frac{\partial n}{\partial T}\right)_{\rho}$$

less than $5.5\times10^{-6}K^{-1}$ wherein n represents the index of refraction, T represents the temperature, and ρ represents the density of said core;

a cladding layer in contact with said core having an index of refraction lower than that of said core, a Young's modulus at least about equal to that of said core, a Poisson's ratio about equal to that of said core, and a thickness equal to at least about one-half of the radius of said core;

a substrate layer in contact with said cladding layer having a Young's modulus greater than that of said core, a Poisson ratio within about 25 percent of that of said core, a thickness at least about one and one-half times greater than the radius of said core, and a coefficient of thermal expansion of not more than one fourth of that of said core; and

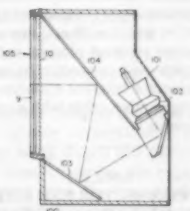
at least one protective coating layer in contact with said substrate layer having a Young's modulus not in excess of about 1×10^{-3} times that of said core and a Poisson ratio from about 0.48 to about 0.52.

4,482,206

REAR PROJECTION TELEVISION SCREEN HAVING A MULTI-SURFACE FRESNEL LENS

Bertram VanBreemen, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1983, Ser. No. 487,384
Int. Cl.³ G03B *21/60*
U.S. Cl. 350—128 **7 Claims**



1. A rear projection television receiver comprising:

a video image source; and

a rear projection screen comprising:

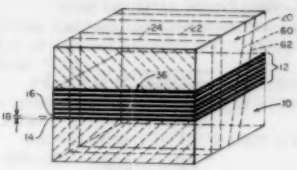
a field lens for substantially collimating light from said mirror and incorporating a first circular Fresnel lens for receiving light from said mirror for refracting said light through a first angle and a second circular Fresnel lens for receiving said light from said first Fresnel lens for refracting said light through a second angle, the region between said first and second Fresnel lenses being substantially devoid of any light reflecting surfaces; and

a focusing lens incorporating an image surface for focusing light from said field lens onto said image surface.

4,482,207
OPTICAL GRATING AND METHOD OF MANUFACTURE

Lowell E. Thomas, Tewksbury, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Jun. 29, 1981, Ser. No. 278,672
Int. Cl.[3] G02B 5/18
U.S. Cl. 350—162.20 4 Claims



1. A method of providing an optical grating with a controllable frequency comprising the steps of:

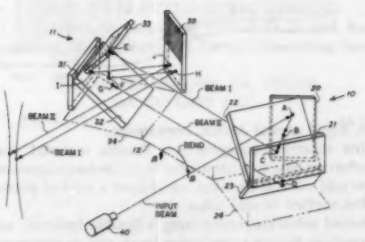
sequentially building by thin film deposition techniques a structure having multiple layers of optical material wherein alternating layers are made of different material and,

forming an optical grating from the structure by sectioning the structure at a predetermined angle, said angle in part determining the frequency of the completed grating.

4,482,208
LATERAL TRANSFER SYSTEM FOR AN OPTICAL BEAM

Richard H. Pohle, Monta Vista, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Sep. 17, 1982, Ser. No. 419,554
Int. Cl.[3] G02B 5/04
U.S. Cl. 350—286 5 Claims



1. A bipentaprism comprising:

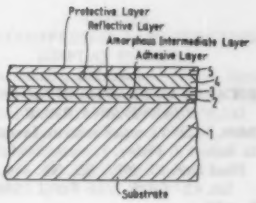
(a) a first reflecting element and a second reflecting element, said first and second reflecting elements being positioned with respect to each other to form a pentaprism; and

(b) a reflective roof element and a beam splitting roof element, said roof elements being positioned with respect to each other to form a roof-pentaprism with said first reflecting element.

4,482,209
MIRROR STRUCTURE

Virinder Grewal, Ebersberg, and Werner Reindl, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,099
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3007612
Int. Cl.[3] G02B 5/08; B32B 9/00, 3/00; C25D 11/02
U.S. Cl. 350—642 7 Claims

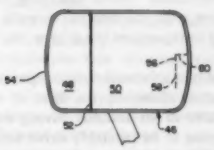


5. A process for producing a layered mirror structure comprising a polished metal surface, an adhesive layer disposed on said metal surface, an amorphous intermediate layer of aluminum oxide disposed on the adhesive layer, a reflective layer applied to the intermediate layer and a protective layer covering the reflective layer, said process including positioning the substrate in a vacuum and despositing each of said layers in sequence on said substrate.

4,482,210
SAFETY MIRROR

Larry W. Brookman, 1380 Farrington Rd., Philadelphia, Pa. 19151

Continuation-in-part of Ser. No. 429,244, Sep. 30, 1982,. This application Feb. 22, 1983, Ser. No. 468,132
Int. Cl.[3] G02B 5/08
U.S. Cl. 350—631 8 Claims



1. A side mount safety mirror for lateral and vertical adjustable mounting on the left side of a vehicle wherein the vehicle includes a left rear quarter panel, the left cover panel having a left marginal edge and a top marginal edge, comprising

a frame;

a right, first colored area secured in the frame and being positioned closest to the left side of the vehicle;

a left, second colored area secured in the frame, the first colored area being interposed between the vehicle and the second colored area;

a line of demarcation between the first colored area and the second colored area, the first colored area being larger in width than the second colored area, the line of demarcation being arranged in vertical orientation; and

a guide positioned in the first colored area in spaced relation from the line of demarcation,

the guide comprising a vertical guide line, the vertical guide line and the line of demarcation defining a trailing vehicle sight area therebetween,

the vertical guide line being in alignment with the left mar-

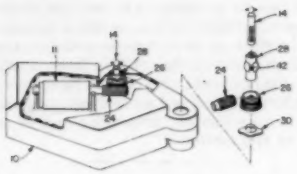
ginal edge of the left rear quarter panel to indicate proper lateral mirror orientation when the mirror is in use.

4,482,211

ELECTRICALLY OPERATED REMOTE CONTROL REARVIEW MIRROR

Robert J. Fisher, 14225 Livonia Crescent, Livonia, Mich. 48154, assignor to Robert J. Fisher, Livonia, Mich.

Filed Dec. 13, 1982, Ser. No. 449,100
Int. Cl.³ G02B *7/18;* F16H *35/10*
U.S. Cl. 350—637 **7 Claims**



1. In a remote control system for a vehicle mirror of the type characterized by a mirror mounted for pivotal movement relative to a base, electric motor means secured to the base and having a worm gear on its output shaft which engages an externally threaded pinion gear rotatably mounted on the base, and wherein the pinion gear is also provided with internal threads to serve as a nut, the rotation of which by the worm gear causes a non-rotatable mirror-engaging screw shaft in threaded engagement with the internal threads of the nut to move longitudinally to reposition the mirror, the improvement which comprises:

the pinion and nut being formed as two separate but concentrically connected elements, the first of said elements being in the form of an annulus having external pinion gear teeth adapted to be rotatably drive about a first axis by the motor-driven worm gear, said annulus having a spherical socket surface on the interior of the annulus, the second of said elements being in the form of a second annulus having a ball-shaped surface on its exterior circumference dimensioned to be snugly but rotatably received in and retained by said spherical socket surface, and said second element having internal nut threads on the interior of said second annulus for driving engagement with a screw shaft, driving formations on said first and second elements for causing the rotation of said first element by the worm gear to produce concurrent rotation of said second element about said first axis, said spherical surfaces and said driving formations permitting relative pivotal movement between said first and second elements about the two mutually perpendicular axes which are perpendicular to said first axis;

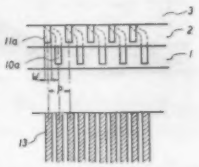
whereby actuation of the motor produces mirror position-adjusting longitudinal movement of the screw shaft, while said spherical surfaces permit the axis of the screw shaft to pivot in response to movement of the screw shaft-to-mirror engagement point transverse to the screw shaft axis in response to pivotal movement of the mirror.

4,482,212

ELECTRODE TERMINAL ASSEMBLY ON A MULTI-LAYER TYPE LIQUID CRYSTAL PANEL

Toshiaki Takamatsu, Tenri; Fumiaki Funada, Yamatokoriyama; Shuhei Yasuda, Nara, and Masataka Matsuura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1981, Ser. No. 305,687
Claims priority, application Japan, Sep. 30, 1980, 55-137424
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—334 **3 Claims**



1. A display device comprising:

a matrix type liquid crystal display panel including a plurality of liquid crystal layers having crossing strip electrodes,

terminal electrodes for each of said liquid crystal layers, disposed so as not to overlap each other, said terminal electrodes having a pitch P and each terminal electrode having a width W, the width W of the terminal electrodes being equal to P/4, and

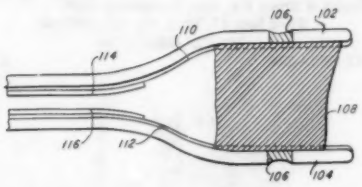
a single flexible wiring film comprising electrodes for connecting to said terminal electrodes said wiring film electrodes having a width being substantially equal to said width W, the width of the terminal electrodes.

4,482,213

PERIMETER SEAL REINFORCEMENT HOLES FOR PLASTIC LCDS

Michael A. Piliavin; Jeffrey B. Sampsell, both of Plano, and Perry A. Penz, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 23, 1982, Ser. No. 444,263
Int. Cl.³ G02F *1/133;* B65D *73/00*
U.S. Cl. 350—334 **11 Claims**



8. A liquid crystal device, comprising:

a first substrate comprising a flexible material, said first substrate having a conductor layer, and an alignment layer on said conductor layer, on at least a central portion of a first surface of said substrate;

a second substrate, comprising a flexible material, said first substrate having a conductor layer, and an alignment layer on said conductor layer, on at least a central portion of a first surface of said substrate;

said first and second substrates being joined along the respective primeters thereof by a glue seal, said glue seal extending along substantially the entire perimeter of said first and second substrates, said first and second substrates being joined so that said first surfaces of both said substrates mutually face together and define a cavity therebetween;

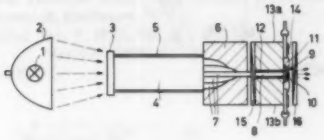
a liquid crystal material filling said cavity;
at least one said substrate containing reinforcement holes near the perimeter of said first face thereof, said holes being at least partially filled with hardened glue.

4,482,214

DEVICE FOR APPLYING LIGHT TO A LINEAR ARRAY OF MAGNETO-OPTICAL LIGHT SWITCHES, NOTABLY FOR OPTICAL PRINTERS

Bernhard Hill, Hamburg, and Gerd Much, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 12, 1982, Ser. No. 377,635
Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119784
Int. Cl.³ G02B *5/16, 5/172;* G02F *1/09*
U.S. Cl. 350—355 **11 Claims**



1. A device for illuminating a line-shaped light switching mask having a plurality of magneto-optical light modulation elements arranged between polarizers, said device comprising a light source, an optical transmission system for transmitting light emitted by said light source to the light switching mask, and means for homogenizing the distribution of light transmitted to the light switching mask, said optical transmission system including an adapter having an entrance surface which corresponds to the geometry of said light source and an exit surface which corresponds to the geometry of the line-shaped light switching mask, and a light conductor rod arranged between said light source and said adapter and extending in the direction of the incident light, said rod having a cross-section corresponding at least approximately to said entrance surface of said adapter, and wherein said homogenizing means includes a thin light conductor plate arranged between said adapter and said light switching mask so that the longitudinal direction of said exit surface of said adapter was well as that of the light switching mask are parallel to the plane of said light conductor plate.

4,482,215

MECHANICAL INTERFACE FOR PROXIMITY COUPLED ELECTRO-OPTIC DEVICES

Robert A. Sprague, Saratoga, and William D. Turner, San Marino, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1980, Ser. No. 187,918
Int. Cl.³ G02F *1/03*
U.S. Cl. 350—356 **14 Claims**

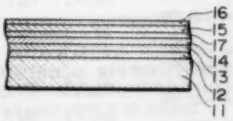
1. In an electro-optic device including
an electro-optic element,
a plurality of electrodes intimately coupled to said electro-optic element, and
means coupled to said electrodes for applying voltages thereto, whereby electric fields are created within said electro-optic element;
the improvement comprising
a substrate, at least one of said electrodes being supported by said substrate,
means engaged with said electro-optic element and with said substrate for bonding said substrate to said electro-optic element, and
spacer means disposed between said substrate and said electro-optic element for gapping said substrate supported electrodes from said electro-optic element, thereby causing said fields to proximity couple into said electro-optic element.

4,482,216

SOLID STATE COMPLEMENTARY ELECTROCHROMIC DISPLAY DEVICES

Eigo Hashimoto, Sakado, and Takanori Nanya, Sayama, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1981, Ser. No. 318,332
Claims priority, application Japan, Nov. 11, 1980, 55-158451; Dec. 5, 1980, 55-171014
Int. Cl.³ G02F *1/23*
U.S. Cl. 350—357 **12 Claims**



1. A solid state complimentary electrochromic display device comprising:
a substrate made of an optically transparent material;
a first electrode which is contact with said substrate and made of an optically transparent material;
a fist solid state electrochromic material which is in contact with said first electrode, permits an oxidation-reduction reaction, and is one of a reduction coloration type electrochromic material and an oxidation coloration type electrochromic material;
a solid state ion permeable insulating layer which is in contact with said first electrochromic material layer and is made of halogenide;
a second solid state electrochromic material layer which is in contact with said ion permeable insulating layer, permits the oxidation-reduction reaction, and is the other of a reduction coloration type electrochromic material and an oxidation coloration type electrochromic material; and
a second electrode which is in contact with said second electrochromic material layer;
whereby on applying a voltage in which the electrode in contact with the reduction coloration type electrochromic material layer is negative and the electrode in contact with the oxidation coloration type electrochromic material layer is positive, the first and second solid state electrochromic material layers are simultaneously colored, and on applying a voltage in which the electrode in contact with the reduction coloration type electrochromic material layer is positive and the electrode in contact with the oxidation coloration type electrochromic material layer is negative, the first and second solid state electrochromic material layers are simultaneously bleached.

4,482,217

PLÖSSL TYPE EYEPIECE FOR USE IN ASTRONOMICAL INSTRUMENTS

Albert Nagler, 15 Green Hill La., Spring Valley, N.Y. 10977

Filed Feb. 18, 1983, Ser. No. 467,877
Int. Cl.³ G02B *3/00, 25/00*
U.S. Cl. 350—410 **1 Claim**

1. A Plössl type eyepiece comprising a pair of symmetrical achromatic doublets wherein the convex crown elements face each other and the external flint elements are double concave

elements and wherein, for a 26 millimeter focal length eyepiece, the lens data conforms substantially to the following

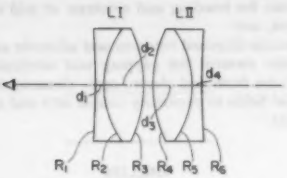


table wherein lens radii and axial thicknesses are given in millimeters:

Lens	Radii	Axial Thickness	Refractive Index	Abbe Number
LI	R1 = −169.87			
		d1 = 2	N_d = 1.667	ν = 33
	R2 = +21.598			
		d2 = 9	N_d = 1.658	ν = 51
	R3 = −29.44			
LII	R4 = +29.44			
		d3 = 9	N_d = 1.658	ν = 51
	R5 = −21.598			
		d4 = 2	N_d = 1.667	ν = 33
	R6 = +169.87			

and wherein the lens separation is one millimeter.

4,482,218

ZOOM LENS

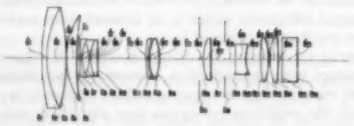
Kazuo Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 320,093

Claims priority, application Japan, Nov. 11, 1980, 55-158504

Int. Cl.³ G02B *9/64, 15/18*

U.S. Cl. 350—427 **2 Claims**



1. A zoom lens system comprising, from front to rear:
- a focusing lens group having the focusing function;
- a zooming lens group having the image magnification varying function;
- a diaphragm for limiting a light beam from said zooming lens group;
- a relay lens group stationary during focusing and zooming and forming an image of said diaphragm at an almost infinite distance position from an image plane of said lens system, said relay lens group comprising, from front to rear, a positive first lens, a negative second lens, a positive third lens and a positive fourth lens; and
- a stripe filter disposed between said relay lens group and the image plane, said diaphragm and relay lens group further being arranged to cause the principal rays of the light beam emerging from said relay lens group to enter said stripe filter in parallel.

4,482,219

HIGH SPEED CATADIOPTRIC OBJECTIVE LENS SYSTEM

Ludvik Canzek, Unterentfelden, Switzerland, assignor to Kern & Co. AG, Aarau, Switzerland

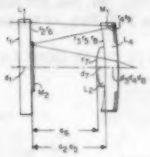
Continuation of Ser. No. 967,973, Dec. 8, 1978, abandoned. This application Oct. 3, 1980, Ser. No. 193,429

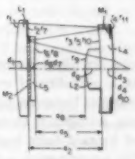
Claims priority, application Switzerland, Dec. 8, 1977, 015052/77

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ G02B *17/08*

U.S. Cl. 350—444 **5 Claims**





1. A high speed catadioptric objective system lens consisting of:
- a positive front lens with the front surface radius being smaller than the rear surface radius;
- a negative meniscus lens on the image side of said positive front lens with the back surface being convex toward the image and provided with a mirrored portion surrounding a light permeable central portion;
- a positive lens cemented onto the front surface central portion of said negative meniscus lens; and
- a counter mirror applied to the central portion of said positive front lens.

4,482,220

DEVICE FOR CORRECTIVELY COMPENSATING THE APERTURE ERROR IN REPRODUCING SYSTEMS

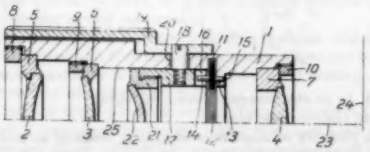
Klaus D. Schaefer, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 290,934

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030205

Int. Cl.³ G02B *9/00*; G03B *3/00*

U.S. Cl. 350—450 **12 Claims**



1. A device for the corrective compensation of an altering aperture error formed by variation of an aperture stop in a

reproducing system having an optical axis of image recording apparatus, comprising:

said reproducing system (2, 3, 4) comprising one optical member (22, 33, 43) affecting said aperture error and displaceably supported along said optical axis (23), said reproducing system having at least two fixed optical components (2, 3, 4) and said aperture stop, said displacement varying said optical member's relative position with respect to said fixed optical components (2, 4) and setting means (17, 28) displacing said optical member (22, 33, 43) by an extent corresponding to a corrective compensating nominal value along said optical axis (23) of said reproducing system (2, 3, 4) as a function of the variation in said aperture stop.

4,482,221

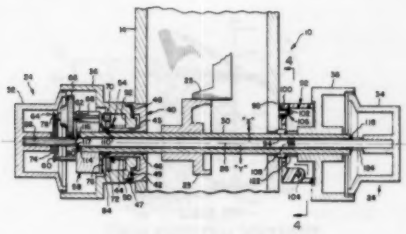
MICROSCOPE FINE FOCUS CONTROL MECHANISM

James A. Clark, Honeoye Falls, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,734

Int. Cl.³ G02B *21/26*

U.S. Cl. 350—530 **7 Claims**



1. In an optical instrument having a support and an adjusting system supported thereby, said system having at least one shaft and mechanism cooperatively engaged thereto for providing relative movement between the instrument's optics and an object being examined, a fine focusing control mechanism comprising:

a rotatable member eccentrically positioned between said at least one shaft and said support for accomplishing fine focusing whereby rotation of said rotatable member displaces said at least one shaft with respect to said support a sufficient amount such that said mechanism imparts fine focusing movement.

4,482,222

FILM VIEWER AND ANALYZER AND METHOD

William H. Stutz, 3446 Wonderview Dr., Los Angeles, Calif. 90068

Filed Nov. 17, 1982, Ser. No. 442,363

Int. Cl.³ G03B *19/18, 21/32*

U.S. Cl. 352—39 **16 Claims**

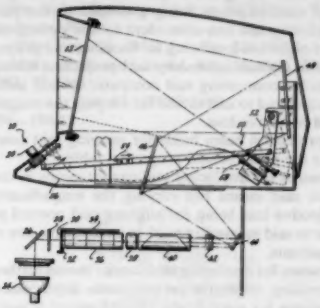
1. In combination with a viewing device having a screen upon which an image can be viewed, apparatus for making measurements on the image comprising:

(a) first projection means capable of superimposing a reference mark on the viewed image;

(b) first carriage means coupled to said first projection means including transducer means for generating signals representative of distance traveled by said projection means from a predetermined rest location;

(c) first means for moving said first carriage means to locate said reference mark at a desired point on the viewed image;

(d) measuring means coupled to said transducer means for producing a signal corresponding to and representative of the location of the desired point relative to a point corresponding to the rest location of said reference mark; and



(e) display means coupled to said measuring means for providing a visible record of the measuring means signal.

4,482,223

PHOTOGRAMMETRICAL RECTIFICATION DEVICE AND METHOD OF DETECTING THE ADJUSTING VALUES FOR THE SAME

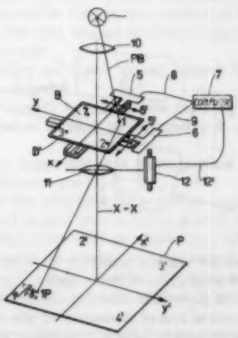
Raimund Koch, 24, Fritz-Ritter-Strasse, 6902 Jena-Lobeda, District of Gera, and Paul Spata, 64, Hermann-Löns-Strasse, 6900 Jena, District of Gera, both of German Democratic Rep.

Filed Jun. 15, 1982, Ser. No. 388,687

Claims priority, application German Democratic Rep., Jul. 22, 1981, 231974

Int. Cl.³ G03B *23/08*

U.S. Cl. 353—5 **3 Claims**



1. A photogrammatic rectifying device of the non-tilting lens type comprising

a light source for emitting a projection beam,

a condenser lens for shaping said projection beam,

an aerial photograph to be rectified,

a carrier means for mounting said photograph,

at least three control points,

an objective lens having an optical axis,

a projection table having four quadrants,

at least one measuring mark being provided in each of said four quadrants,

said light source, said condenser lens, said carrier means, said objective lens and said projection table being subsequently arranged in optical alignment about said optical axis,

means for displacing said carrier means about two coordi-

nate directions at right angles to said optical axis, a computer,

means for varying the magnification of said objective lens, said control points being provided in the plane of said photograph non-coincident to said optical axis,

said objective lens being for focusing said projection beam into a plane defined by said projection table,

means for connecting said computer to said means for displacing and to said means for varying the magnification of said objective lens,

said projection beam being for imaging said control points into the plane of said projection table,

said means for displacing said carrier means in combination with said means for varying the magnification of said objective lens being for aligning said control points relative to said measuring mark in a respective one of said four quadrants,

said means for displacing said carrier means further being for providing respective carrier means displacement values,

said means for varying the magnification of said objective lens further being for providing magnification variation values,

said means for connecting said computer to said means for displacing and to said means for varying said magnification being for feeding said respective displacement values and the magnification variation values, respectively, into said computer.

4,482,224

COMPENSATION DEVICE AT PROJECTORS WITH EXCHANGEABLE AND VERTICALLY MOVABLE LENSES

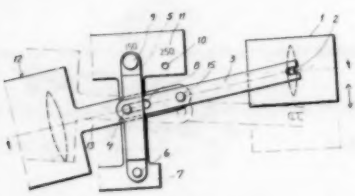
Kent A. Johansson, Angered, Sweden, assignor to Victor Hasselblad Aktie Bolag, Gothenburg, Sweden

Filed Sep. 28, 1983, Ser. No. 536,755

Claims priority, application Sweden, Oct. 4, 1982, 8205639

Int. Cl.³ G03B *21/00*

U.S. Cl. 353—101 **3 Claims**



1. A device for use in a projector, preferably a slide projector, provided with a lens barrel, which in operative position of the projector is preferably movable vertically and perpendicularly to the optical axis of an associated selected lens, and with a lighting arrangement, which is mounted rotatably about an imaginary axis located in the plane of an upright slide located in said projector and in operative position for optimum lighting through the slide to a focal plane of the selected lens, the respective lens barrel and lighting arrangement being mechanically coupled to each other via at least one articulated arm mechanism having a center of rotation on said imaginary axis in the slide plane, characterized in that the articulated arm mechanism comprises two co-operating portions, a front portion including a lens arm hingedly connected to structure mounting said selected lens to said projector, and a rear portion including a lighting arm rigidly connected to the lighting arrangement, said lighting arm connected to the lens arm that extends at least substantially rearward to said imaginary axis in the slide plane, the lighting arm extending ahead of said imaginary axis a distance to the lens barrel and being hingedly mounted at a fixed first joint located on the aforementioned imaginary axis in the slide plane, the lens arm and lighting arm being hingedly connected via a second joint at a forward end of the lighting arm, the lens arm being hingedly connected via a third rear joint to a sector arm which is pivotal about a fourth fixed joint located to the side of and preferably below the first joint for the lighting arm, and that the rear, third joint of the lens arm, by rotation of the sector arm about its fixed fourth joint, is movable along a groove located in the lens arm such that by the mechanical coupling between the lens arm and lighting arm, the lighting arrangement, in response to the position of the sector arm, is caused to assume positions corresponding to different positions of the focal plane of the selected lens.

4,482,225

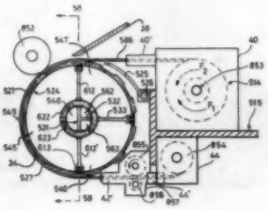
PHOTOCOMPOSING MACHINE AND METHOD

Louis M. Moyroud, Delray Beach, Fla.; Michel Bongard, Saint Sulpice, Switzerland; Paul A. Vernez, Chavannes, Switzerland, and Michel Moulin, Lausanne, Switzerland, assignors to Autologic, S.A., Bussigny-pres-Lausanne, Switzerland

Division of Ser. No. 374,172, May 3, 1982, Pat. No. 4,431,295, which is a division of Ser. No. 198,284, Oct. 17, 1980, Pat. No. 4,329,027. This application Feb. 13, 1984, Ser. No. 579,817

Int. Cl.³ B41B *21/16*; G03B *27/60*

U.S. Cl. 354—5 **9 Claims**



1. In or for a photocomposing machine, output means for moving a flexible photosensitive record medium past an exposure station at which images are projected onto said medium, said output means comprising a hollow drum with holes in its walls, means for dividing the hollow interior of said drum into sections, drive means for rotating said drum, and holding means for partially evacuating at least one selected section of said drum to hold said medium onto the surface of said drum.

4,482,226

WINDING AND REWINDING DEVICE FOR CAMERA

Hideo Tamamura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha

Filed Aug. 25, 1982, Ser. No. 411,355

Claims priority, application Japan, Sep. 2, 1981, 56-138148; Sep. 2, 1981, 56-138149

Int. Cl.³ G03D *1/04*

U.S. Cl. 354—173.1 **11 Claims**

1. A camera including:

(a) an electric motor for transmitting a driving torque;

(b) rewinding means for rewinding a film;

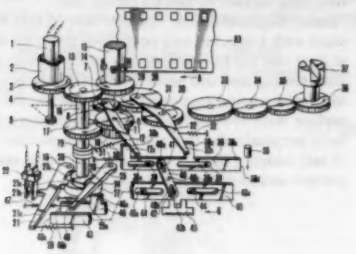
(c) a first gear arranged to rotate in response to the driving torque transmitted from said motor;

(d) a second gear arranged for engagement with said first gear to transmit the driving torque of said motor to said rewinding means;

(e) supporting means for supporting said first gear, said supporting means holding said first gear in a position for meshing engagement with said second gear when rewinding the film until the rewinding of the film is completed;

(f) changeover means for bringing said first and said second gears into meshing engagement with each other in response to switching of the camera from a winding mode to a rewinding mode; and

(g) means movable in response to actuation of a shutter button on the camera for hindering said changeover means from being actuated so long as the shutter button is



under operation, and for hindering the shutter button from being actuated when said changeover means is in the rewinding position.

4,482,227

FILM FEEDING METHOD

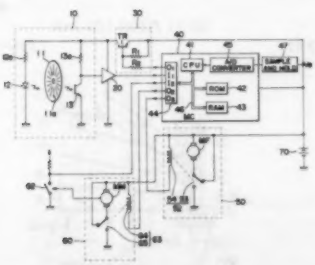
Kazuo Shiozawa, Konishiroku Apart 311, No. 1306-5, Naganuma-Cho, Hachioji-Shi, Tokyo, and Seiichi Isoguchi, Tokyo, both of Japan, assignors to Kazuo Shiozawa, Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,251

Claims priority, application Japan, Nov. 24, 1981, 56-186932; Nov. 24, 1981, 56-186933

Int. Cl.³ G03B *17/36*

U.S. Cl. 354—173.11 **5 Claims**



1. A method of feeding film in segments of predetermined length in apparatus employing a film feed motor energizable from an electric power source and which tends to overrun after it is deenergized, said method comprising the following steps to feed one of said segments:

energizing said film feed motor from said electric power source sufficient to feed said film for a first length a little shorter than said predetermined length,

and de-energizing said film feed motor and allowing said motor to overrun sufficient to feed said film for the remaining portion of said predetermined length.

4,482,228

LENS CHANGEOVER MECHANISM FOR USE IN PHOTOGRAPHIC CAMERA

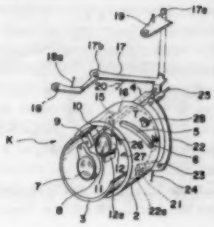
Susumu Fujita, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 10, 1983, Ser. No. 521,807

Claims priority, application Japan, Aug. 10, 1982, 57-139533; Jan. 11, 1983, 58-3044

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—195.12 **6 Claims**



1. A lens changeover mechanism for use in a photographic camera, said camera including a camera body and a master lens and a conversion lens such that said photographic camera is selectively provided with a master lens system constituted only by said master lens and a conversion lens system is constituted by both said master lens and said conversion lens, said lens changeover mechanism functioning to change over either one of the master lens system and the conversion lens system to the other one of the master lens system and the conversion lens system and said mechanism comprising:

a changeover ring;

a lens barrel axially movably fitted into said changeover ring so as to be movable to projected and retracted positions thereof in response to changeover rotation of said changeover ring in first and second directions opposite to each other, respectively;

a focusing member provided in said camera body of said photographic camera;

a focus guide, slidably supported, for focusing adjustment, by said lens barrel so as to be engaged with said focusing member;

said master lens supported at a front portion of said lens barrel by said focus guide;

said conversion lens pivotally supported at a rear portion of said lens barrel by said lens barrel so as to be brought into and out of alignment with an optical axis of said master lens in response to the changeover rotation of said changeover ring in said first and second directions, respectively;

a changeover member pivotally supported by said camera body; and

an auxiliary focus guide supported by said changeover member so as to be inserted between and retracted away from said focus guide and said focusing member in response to the changeover rotation of said changeover ring in said first and second directions, respectively.

4,482,229

FILM AUTO LOADING MECHANISM FOR CAMERA

Yoji Sugiura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha

Filed Sep. 20, 1982, Ser. No. 420,312

Claims priority, application Japan, Oct. 7, 1981, 56-149067[U]

Int. Cl.³ G03B *1/04*

U.S. Cl. 354—212 **12 Claims**

1. A film auto loading mechanism for automatically bringing a leader of film into winding engagement on a takeup spool, including:

nate directions at right angles to said optical axis, a computer,

means for varying the magnification of said objective lens, said control points being provided in the plane of said photograph non-coincident to said optical axis,

said objective lens being for focusing said projection beam into a plane defined by said projection table,

means for connecting said computer to said means for displacing and to said means for varying the magnification of said objective lens,

said projection beam being for imaging said control points into the plane of said projection table,

said means for displacing said carrier means in combination with said means for varying the magnification of said objective lens being for aligning said control points relative to said measuring mark in a respective one of said four quadrants,

said means for displacing said carrier means further being for providing respective carrier means displacement values,

said means for varying the magnification of said objective lens further being for providing magnification variation values,

said means for connecting said computer to said means for displacing and to said means for varying said magnification being for feeding said respective displacement values and the magnification variation values, respectively, into said computer.

4,482,224

COMPENSATION DEVICE AT PROJECTORS WITH EXCHANGEABLE AND VERTICALLY MOVABLE LENSES

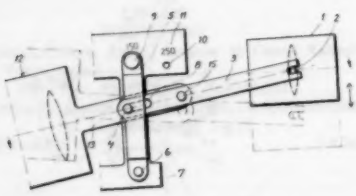
Kent A. Johansson, Angered, Sweden, assignor to Victor Hasselblad Aktie Bolag, Gothenburg, Sweden

Filed Sep. 28, 1983, Ser. No. 536,755

Claims priority, application Sweden, Oct. 4, 1982, 8205639

Int. Cl.³ G03B *21/00*

U.S. Cl. 353—101 **3 Claims**



1. A device for use in a projector, preferably a slide projector, provided with a lens barrel, which in operative position of the projector is preferably movable vertically and perpendicularly to the optical axis of an associated selected lens, and with a lighting arrangement, which is mounted rotatably about an imaginary axis located in the plane of an upright slide located in said projector and in operative position for optimum lighting through the slide to a focal plane of the selected lens, the respective lens barrel and lighting arrangement being mechanically coupled to each other via at least one articulated arm mechanism having a center of rotation on said imaginary axis in the slide plane, characterized in that the articulated arm mechanism comprises two co-operating portions, a front portion including a lens arm hingedly connected to structure mounting said selected lens to said projector, and a rear portion including a lighting arm rigidly connected to the lighting arrangement, said lighting arm connected to the lens arm that extends at least substantially rearward to said imaginary axis in the slide plane, the lighting arm extending ahead of said imaginary axis a distance to the lens barrel and being hingedly mounted at a fixed first joint located on the aforementioned imaginary axis in the slide plane, the lens arm and lighting arm being hingedly connected via a second joint at a forward end of the lighting arm, the lens arm being hingedly connected via a third rear joint to a sector arm which is pivotal about a fourth fixed joint located to the side of and preferably below the first joint for the lighting arm, and that the rear, third joint of the lens arm, by rotation of the sector arm about its fixed fourth joint, is movable along a groove located in the lens arm such that by the mechanical coupling between the lens arm and lighting arm, the lighting arrangement, in response to the position of the sector arm, is caused to assume positions corresponding to different positions of the focal plane of the selected lens.

4,482,225

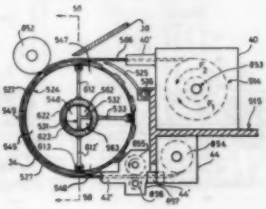
PHOTOCOMPOSING MACHINE AND METHOD

Louis M. Moyroud, Delray Beach, Fla.; Michel Bongard, Saint Sulpice, Switzerland; Paul A. Vernez, Chavannes, Switzerland, and Michel Moulin, Lausanne, Switzerland, assignors to Autologic, S.A., Bussigny-pres-Lausanne, Switzerland

Division of Ser. No. 374,172, May 3, 1982, Pat. No. 4,431,295, which is a division of Ser. No. 198,284, Oct. 17, 1980, Pat. No. 4,329,027. This application Feb. 13, 1984, Ser. No. 579,817

Int. Cl.³ B41B *21/16*; G03B *27/60*

U.S. Cl. 354—5 **9 Claims**



1. In or for a photocomposing machine, output means for moving a flexible photosensitive record medium past an exposure station at which images are projected onto said medium, said output means comprising a hollow drum with holes in its walls, means for dividing the hollow interior of said drum into sections, drive means for rotating said drum, and holding means for partially evacuating at least one selected section of said drum to hold said medium onto the surface of said drum.

4,482,226

WINDING AND REWINDING DEVICE FOR CAMERA

Hideo Tamamura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha

Filed Aug. 25, 1982, Ser. No. 411,355

Claims priority, application Japan, Sep. 2, 1981, 56-138148; Sep. 2, 1981, 56-138149

Int. Cl.³ G03D *1/04*

U.S. Cl. 354—173.1 **11 Claims**

1. A camera including:

(a) an electric motor for transmitting a driving torque;

(b) rewinding means for rewinding a film;

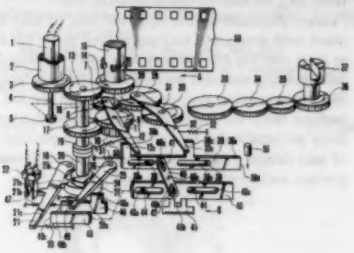
(c) a first gear arranged to rotate in response to the driving torque transmitted from said motor;

(d) a second gear arranged for engagement with said first gear to transmit the driving torque of said motor to said rewinding means;

(e) supporting means for supporting said first gear, said supporting means holding said first gear in a position for meshing engagement with said second gear when rewinding the film until the rewinding of the film is completed;

(f) changeover means for bringing said first and said second gears into meshing engagement with each other in response to switching of the camera from a winding mode to a rewinding mode; and

(g) means movable in response to actuation of a shutter button on the camera for hindering said changeover means from being actuated so long as the shutter button is



under operation, and for hindering the shutter button from being actuated when said changeover means is in the rewinding position.

4,482,227

FILM FEEDING METHOD

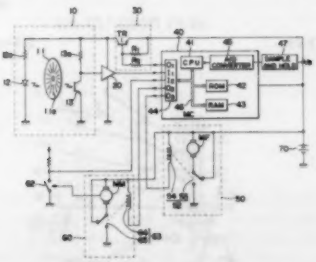
Kazuo Shiozawa, Konishiroku Apart 311, No. 1306-5, Naganuma-Cho, Hachioji-Shi, Tokyo, and Seiichi Isoguchi, Tokyo, both of Japan, assignors to Kazuo Shiozawa, Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,251

Claims priority, application Japan, Nov. 24, 1981, 56-186932; Nov. 24, 1981, 56-186933

Int. Cl.³ G03B *17/36*

U.S. Cl. 354—173.11 5 Claims



1. A method of feeding film in segments of predetermined length in apparatus employing a film feed motor energizable from an electric power source and which tends to overrun after it is deenergized, said method comprising the following steps to feed one of said segments:

energizing said film feed motor from said electric power source sufficient to feed said film for a first length a little shorter than said predetermined length,

and de-energizing said film feed motor and allowing said motor to overrun sufficient to feed said film for the remaining portion of said predetermined length.

4,482,228

LENS CHANGEOVER MECHANISM FOR USE IN PHOTOGRAPHIC CAMERA

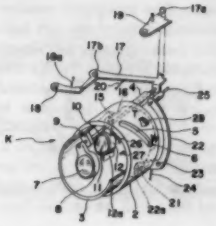
Susumu Fujita, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 10, 1983, Ser. No. 521,807

Claims priority, application Japan, Aug. 10, 1982, 57-139533; Jan. 11, 1983, 58-3044

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—195.12 6 Claims



1. A lens changeover mechanism for use in a photographic camera, said camera including a camera body and a master lens and a conversion lens such that said photographic camera is selectively provided with a master lens system constituted only by said master lens and a conversion lens system is constituted by both said master lens and said conversion lens, said lens changeover mechanism functioning to change over either one of the master lens system and the conversion lens system to the other one of the master lens system and the conversion lens system and said mechanism comprising:

a changeover ring;

a lens barrel axially movably fitted into said changeover ring so as to be movable to projected and retracted positions thereof in response to changeover rotation of said changeover ring in first and second directions opposite to each other, respectively;

a focusing member provided in said camera body of said photographic camera;

a focus guide, slidably supported, for focusing adjustment, by said lens barrel so as to be engaged with said focusing member;

said master lens supported at a front portion of said lens barrel by said focus guide;

said conversion lens pivotally supported at a rear portion of said lens barrel by said lens barrel so as to be brought into and out of alignment with an optical axis of said master lens in response to the changeover rotation of said changeover ring in said first and second directions, respectively;

a changeover member pivotally supported by said camera body; and

an auxiliary focus guide supported by said changeover member so as to be inserted between and retracted away from said focus guide and said focusing member in response to the changeover rotation of said changeover ring in said first and second directions, respectively.

4,482,229

FILM AUTO LOADING MECHANISM FOR CAMERA

Yoji Sugiura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha

Filed Sep. 20, 1982, Ser. No. 420,312

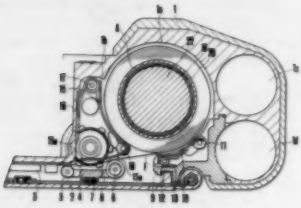
Claims priority, application Japan, Oct. 7, 1981, 56-149067[U]

Int. Cl.³ G03B *1/04*

U.S. Cl. 354—212 12 Claims

1. A film auto loading mechanism for automatically bringing a leader of film into winding engagement on a takeup spool, including:

(A) a takeup spool;
(B) a sprocket, said sprocket and said takeup spool being arranged to define a space therebetween; and
(C) guide means for guiding the leader of film so as to be trained around said takeup spool, said guide means including:
(a) means defining a center of swinging motion about which said guide means swings;
(b) a working portion operating so that the film is in contact with said takeup spool; and

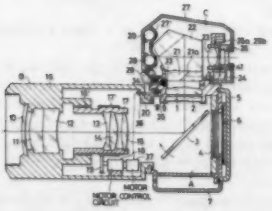


(c) a guide area for guiding the leader of film, said guide area having a first portion which extends from said center of swinging motion to said working portion to allow for the film leader to approach said takeup spool, and a second portion which extends from said working portion in a direction to said sprocket in order that when loading the film, the leader of film is prevented from migrating into said space between said sprocket and said takeup spool.

4,482,230
VIEW FINDER UNIT MOUNTED ON A SINGLE LENS REFLEX CAMERA

Kenichi Magariyama, Yokohama; Makoto Kimura, Tokyo, and Hiroshi Terunuma, Ichikawa, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,465
Claims priority, application Japan, Feb. 1, 1982, 57-13334
Int. Cl.³ G03B *13/02*
U.S. Cl. 354—219 **2 Claims**

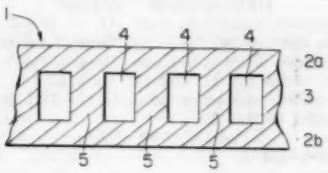


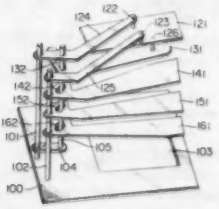
1. A view finder unit removably mounted on a single lens reflex camera body having an opening portion provided to direct an imaging light beam projected by a picture-taking lens to the outside of said camera body, said view finder unit comprising:
(a) a housing removably mounted on said camera body and having an opening portion for directing said imaging light beam into said housing, said opening portion being coincident with the opening portion of said camera body;
(b) an optical system disposed in said housing to enable an image formed by said imaging light beam to be observed, said optical system including a penta roof prism for bending substantially at right angles the light path of said imaging light beam passed through the opening portion of said housing, and a finder eyepiece for directing said imaging light beam emergent from said prism to the outside of said housing to thereby enable said image to be observed, said penta roof prism having a first reflecting surface formed into a roof shape and a second reflecting surface reflecting said imaging light beam from said first reflecting surface to said eyepiece; and
(c) means disposed on the opposite side of said finder eyepiece with respect to said penta roof prism for supporting at least one bar-like battery in a space provided between said housing and said second reflecting surface, said bar-like battery being supported along said second reflecting surface with the longitudinal direction thereof substantially perpendicular to a plane which is parallel with both of said imaging light beams passed through said opening portion and emergent from said prism.

4,482,231
LIGHT-INTERCEPTING BLADE FOR A LIGHT CONTROL DEVICE

Hironobu Kato, Urawa; Masaru Ichikawa; Atsushi Sano, both of Yokohama; Yoshiaki Tanabe, Kawasaki, and Yoshiyuki Nakano, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 476,936
Claims priority, application Japan, Mar. 31, 1982, 57-52553
Int. Cl.³ G03B *9/40*
U.S. Cl. 354—246 **16 Claims**





1. In a photographic device, a planar light-intercepting blade adapted to be moved in the direction of a surface, thereof at a position across the optical path of said photographic device to thereby control the quantity of light passing through said optical path, said blade comprising:
a pair of outer layers forming the outer surfaces of said blades; and
an inner layer formed between said outer layers and having a number of spaces therein.

4,482,232

FILM CARTRIDGE AND/OR CAMERA WITH FILM ARRESTING MEANS

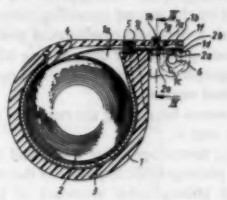
Dieter Engelsmann, Unterhaching; Hubert Hackenberg, Holzkirchen, and Renate Torke, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,583

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110622

Int. Cl.³ G03B *17/26*

U.S. Cl. 354—275 25 Claims



1. A film cartridge, comprising a housing bounding a light-tight film roller chamber; a mouth member arranged for passing a film therethrough and located outside said light-tight film roll chamber, said mouth member having a wall provided with at least one slot-shaped opening extending in a film transport direction and arranged so as to allow a film actuating member to engage therethrough a film received in said mouth member; arresting means provided in said mouth member and engageable with an initial portion of the film; and camera-actuated means arranged to bring said arresting means out of the engagement with the initial portion of the film.

4,482,233

ARRANGEMENT FOR INTRODUCTION OF A FILM MAGAZINE IN A FILM-PROCESSING UNIT

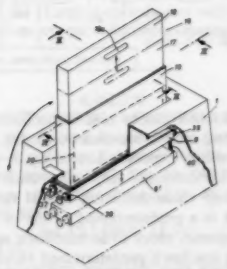
Walter Bauer; Heinrich Farber, both of Munich, and Rudolf Schneider, Pfaffenhofen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,593

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233559

Int. Cl.³ G03D *13/06*

U.S. Cl. 354—312 19 Claims



1. An arrangement for introduction of a film magazine in a film-processing unit, the film magazine including a casing member and a film stack carrier supporting a film stack, said film stack carrier and said casing member being movable relative to each other, said film stack carrier being releasably connectable to the casing member and having an opening for providing access to the film stack in dependence on the relative movement between the casing member and the film stack carrier, the apparatus comprising:

a housing defining an interior and being provided with an inlet slot through which the film magazine is introduced into the interior; and

means for moving the film magazine in a direction of introduction into the interior of the housing from a first position, in which the film magazine is placed into the inlet slot, to a second position, in which a connection between the film stack carrier and the casing member is released, and to a third position, in which the film stack carrier performs a relative movement with respect to the casing member so that the film stack is accessible through said opening, wherein the moving means cooperate with the housing to provide a first light-tight shielding of the interior of the housing when the film magazine is in the first position and is moved into the second position, and wherein the housing cooperates with the casing member to provide a second light-tight shielding when the film magazine reaches the second position and is moved into the third position so as to prevent an undesired exposure of the film stack within the film stack carrier.

4,482,234

AUTOMATIC FOCUSING DEVICE

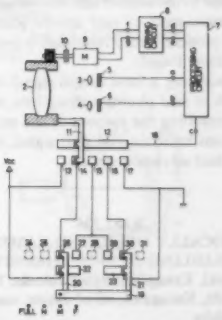
Tadao Takagi, Yokohama, and Nobuo Okabe, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,786

Claims priority, application Japan, Nov. 17, 1981, 56/183001; Nov. 17, 1981, 56/183002; Jul. 29, 1982, 57/131106

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—402 14 Claims



1. A device for moving an objective lens for focusing to an object, in which said objective lens is selectively permitted, by a switching operation, either to be moved within a normal moving range from a position focused to an object at a long distance to a position focused to an object at a short distance, or to be moved into a macro-photographing moving range from said latter position focused to an object at said short distance to a position focused to an object at an even shorter distance, comprising:

(a) means for detecting the position, in reference to a predetermined focal plane, of an image of said object formed by said objective lens;

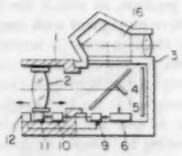
(b) means for driving said objective lens in response to said detecting means; and

(c) means for selectively setting a moving range in which said objective lens is movable by said driving means, wherein said setting means is capable of setting a limited moving range containing at least a part of said normal moving range and at least a part of said macro-photographing moving range.

4,482,235
AUTOMATIC FOCUSING DEVICE FOR CAMERA

Seiichi Yasukawa, Kawasaki; Nobuhiko Terui, Tokyo, and Toru Fukuhara, Isehara, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,787
Claims priority, application Japan, Nov. 20, 1981, 56-186458
Int. Cl.³ G03B 7/08
U.S. Cl. 354—402 8 Claims



1. An automatic focusing device for a camera employing a variable focal length photographing lens system and said device comprising:

focus detection means for measuring the light transmitted through said photographing lens, detecting the existing deviation of the real image plane on which an image of an object is now being really formed, relative to a predetermined focus plane, and generating a signal representing the detected deviation;

driving means for moving said photographing lens for focusing operation;

means for converting the amount of movement of said photographing lens driven for focusing operation into a shift signal related to the shift of said real image plane resulting from the movement of said driven photographing lens based on a predetermined relationship independent of the change of focal length;

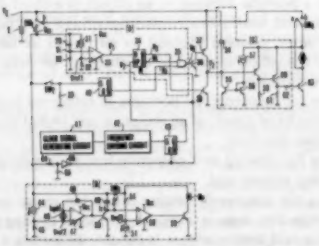
means for generating a focal length signal related to the set focal length of said photographing lens; and

means for controlling the amount of the movement by said driving means based on said shift signal, said focal length signal and said deviation signal.

4,482,236
ELECTRICALLY OPERATED CAMERA AND DISABLING DEVICE THEREFOR

Hiroyoshi Tsuzuki, Kanagawa; Ryuji Tokuda, Tokyo, and Mutsuhide Matsuda, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha

Filed May 13, 1982, Ser. No. 377,942
Claims priority, application Japan, May 25, 1981, 56-79021
Int. Cl.³ G03B 7/00
U.S. Cl. 354—412 11 Claims



1. An electrically operated camera including:

(a) a first operating circuit for carrying out a first photographic sequence of photographic sequences of the camera;

(b) a second operating circuit for carrying out a second photographic sequence of the photographic sequences of the camera and following the first photographic sequence;

(c) switching means for switching an electrical power source such that when the first photographic sequence of the camera is carried out by the first operating circuit, the second operating circuit is deprived of electrical power, and as the camera has transited from the first photographic sequence to the second photographic sequence and the photographic sequence of the camera is being carried out by the second operating circuit, the first operating circuit is deprived of electrical power;

(d) discriminating means for determining whether or not the first photographic sequence by the first operating circuit is accomplished normally;

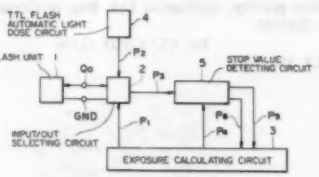
(e) memory means for storing the output of said discriminating means; and

(f) prohibiting means operative when said switching means as the first photographic sequence of the camera transits to the second photographic sequence of the camera, and responsive to the output of said memory means representing that the first photographic sequence of the camera has not been accomplished normally for preventing the second operating circuit from carrying out the second photographic sequence of the camera.

4,482,237
DEVICE FOR DETECTING STOP VALUE DATA FROM FLASH UNIT USED WITH CAMERA

Kenzo Ishibashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 460,080
Claims priority, application Japan, Feb. 10, 1982, 57-18830
Int. Cl.³ G03B 15/05
U.S. Cl. 354—416 1 Claim



1. In a camera which can be used with a flash unit connected to it for providing stop value data consisting of a frequency clock for controlling exposure according to said stop value data, a device for detecting stop value data from flash unit comprising a stop value detecting circuit for counting said frequency clock in a predetermined period of time and transmitting said frequency clock to an automatic stop control unit when the count reaches a predetermined value, and an input-/output selecting circuit provided on the side of said stop value detecting circuit to which the stop value data from the flash unit is supplied and connected to a flash automatic light dose control circuit, said input/output selecting circuit transmitting said stop value data to said stop value detecting circuit when there is no shutter release signal while transmitting a light dose control signal from said flash automatic light dose control circuit to said flash unit when there is a shutter release signal.

4,482,238

BRIGHTNESS WARNING DEVICE FOR CAMERA

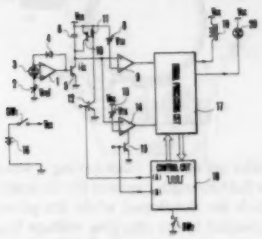
Ryuji Tokuda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha

Filed Dec. 22, 1981, Ser. No. 333,575

Claims priority, application Japan, Dec. 27, 1980, 55-186511; May 27, 1981, 56-80318

Int. Cl.³ G03B 7/08

U.S. Cl. 354—427 **5 Claims**



1. In a warning device for a camera, said camera including light measuring means for producing a first signal corresponding to a brightness of an object to be photographed, timing means, a capacitor, said timing means producing an output signal representative of an exposure value corresponding to a first signal, detecting means connected to the capacitor for detecting the voltage level of the capacitor, and warning means for producing a brightness warning signal on the basis of the output signal from the detecting means, the improvement comprising that:

(a) said light measuring means includes:

(1) a differential amplifier having two input terminals and one output terminal;

(2) a photo-sensitive element responsive to the incident light from the object and connected across two input terminals;

(3) a diode connected to the feedback path of said amplifier so as to logarithmically compress the output from the photo-sensitive element;

(4) a bias voltage source connected to one of the input terminals, the voltage source having the output characteristic proportional to the absolute temperature;

(b) said timing means further includes:

(1) a transistor provided to expand the compressed output, the transistor having a main electrode connected in series to the capacitor and a control electrode connected to the output terminal of said amplifier; and also including charging operation initiating means rendering operative the charging operation of said capacitor independent of an exposure initiating operation of said camera.

4,482,239

IMAGE RECORDER WITH MICROWAVE FIXATION

Nagao Hosono, Chofu, and Kazuo Isaka, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,744

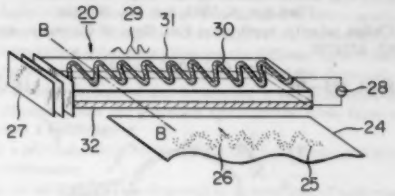
Claims priority, application Japan, Apr. 25, 1981, 56-62956; Apr. 25, 1981, 56-62957

Int. Cl.³ G03G 15/20

U.S. Cl. 355—3 FU **27 Claims**

1. An image recording apparatus with microwave fixation comprising:

means for forming a developed image on a recording material, said developed image being formed by a thermoplastic developer having a mixture of a first component and a second component, said first component being a dielectric material having the property of increasing microwave absorption efficiency as the temperature of said first component increases and capable of generating heat by dielectric loss when microwave energy is absorbed, said second component being a magnetic material capable of generating heat by magnetic loss so as to heat said first component to advance the microwave absorption efficiency of said



first component and to concentrate the microwave energy itself on said developed image; and

means for applying microwave energy to the recording material bearing said developed image and for microwave fixing said developed image onto said recording material.

4,482,240

ELECTROPHOTOGRAPHIC PROCESS UTILIZING ELECTROSTATIC SEPARATION AND APPARATUS THEREFOR

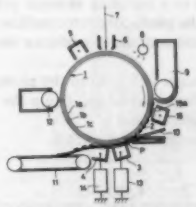
Tsukasa Kuge; Koichi Tanigawa, and Hiroyuki Adachi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1982, Ser. No. 388,153

Claims priority, application Japan, Jun. 24, 1981, 56-97912; Jun. 25, 1981, 56-98959

Int. Cl.³ G03G 15/00

U.S. Cl. 355—3 TR **16 Claims**



1. An electrophotographic apparatus comprising:

means for bearing a visible image composed of coloring particles, the visible image bearing means comprising a conductive base, a photosensitive layer and an insulating surface layer;

means for causing a first corona discharge for providing the coloring particles constituting the visible image with a charge of a first polarity;

means for bringing the visible image bearing means in contact with a transfer sheet;

means for providing the rear face of the transfer sheet by means of a second corona discharge with a charge of a polarity opposite to that of the charge applied by means of the first corona discharge for transferring the visible image onto the transfer sheet; and

means for providing the rear face of the transfer sheet by means of a third corona discharge with a charge of a polarity which is the same as that of the charge applied by means of the first corona discharge to separate the transfer sheet from the visible image bearing means.

4,482,241

DEVICE AND METHOD FOR STRIPPING DEVELOPER FROM A PHOTOCONDUCTIVE SURFACE

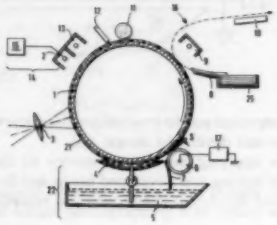
Roland Moraw, and Günther Schädlich, both of Wiesbaden-Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 6, 1983, Ser. No. 482,534

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1982, 3213798

Int. Cl.³ G03G *15/10*

U.S. Cl. 355—10 **16 Claims**



1. An electrophotographic copying process, comprising:

electrostatically charging a photoconductor surface;

exposing the charged photoconductor surface to an information carrying original to obtain a latent charge image on the photoconductor surface;

developing the latent charge image by applying a developer liquid to the photoconductor surface to obtain a toner image;

removing excess developer liquid by applying a bias voltage having an absolute value greater than 1 kV is equal to or higher than the absolute value of the voltage on the charged photoconductor surface, and having a polarity the same as that of the voltage on the charged photoconductor surface to a metering element positioned a short distance from the photoconductor surface and moving the metering element and photoconductor surface relative to one another;

transferring the toner image from the photoconductor surface to a copying material and fixing the toner image on the copying material; and

cleaning the photoconductor surface.

4,482,242

DEVICE AND METHOD FOR STRIPPING DEVELOPER LIQUID FROM A PHOTOCONDUCTIVE SURFACE

Roland Moraw, and Guenther Schaedlich, both of Wiesbaden-Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 6, 1983, Ser. No. 482,540

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1982, 3213797

Int. Cl.³ G03G *15/10*

U.S. Cl. 355—10 **23 Claims**

1. An electrophotographic copying process, comprising:

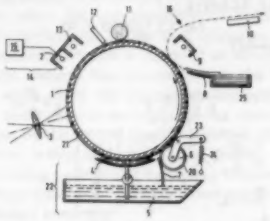
electrostatically charging a photoconductor surface to a voltage higher than the charging voltage U_{maxD} defined as the charging voltage required for maximum toner density;

exposing the charged photoconductor surface to an information carrying original to form a latent charge image;

developing the latent charge image using a developer liquid to produce a visible toner image by moving said photoconductor surface through a developing station;

removing excess developer liquid from said moving photoconductor surface by contacting said photoconductor surface with an element which rotates at a peripheral speed which exceeds the peripheral speed of said photoconductor surface by up to 20%;

transferring the developed toner image by electrophoresis from the photoconductor surface to an image receiving



material under an electric field having a strength which exceeds the field strength required for the transfer of toner images which are developed while the photoconductor surface is charged to the charging voltage U_{maxD}; and

cleaning the photoconductor surface.

4,482,243

IMAGE FORMATION APPARATUS

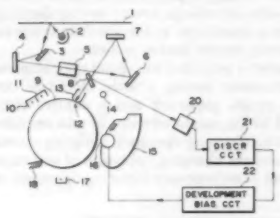
Koji Suzuki, Yokohama; Kouki Kuroda, and Jyoji Nagahira, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 412,808

Claims priority, application Japan, Sep. 8, 1981, 140308

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—14 D **11 Claims**



1. An image formation apparatus comprising:

a plurality of processing means for forming an image of an original on a recording body, said plurality of processing means having reciprocating means for exposing the original to light, developing means for developing an electrostatic latent image formed on said recording body, and means for applying a bias voltage including an AC component to said developing means;

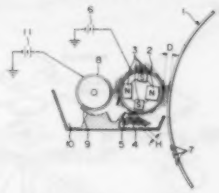
detecting means for detecting a condition of the original in a first scanning by said reciprocating means prior to exposure of the original to light for image formation in a second scanning by said reciprocating means; and

control means for controlling the bias voltage applying means to change the AC component of the developing bias voltage in the second scanning in accordance with an output from said detecting means in the first scanning.

4,482,244
MAGNETIC BRUSH CLEANING DEVICE

Yoshio Yamazaki; Kiyoaki Kawamoto, and Shun Kawata, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,799
Claims priority, application Japan, Nov. 11, 1981, 56-179837; Nov. 11, 1981, 56-179838
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—15 **7 Claims**



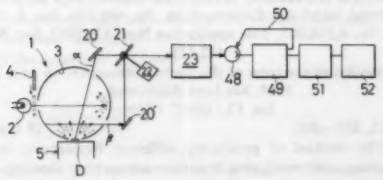
1. A magnetic brush cleaning device for removing toner remaining on the surface of an image retaining member of electrostatic reproducing apparatus or the like, comprising: a magnetic attraction means having an electrically conductive roller and a magnet provided in said roller, disposed so as to face said surface of said image retaining member, a magnetic and insulating carrier attracted on the surface of said roller by magnetic force, restriction means adjacent said magnetic attraction means to restrict the height of a brushlike ear of said magnetic and insulating carrier attracted to said magnetic attraction means, said brushlike ear of said magnetic and insulating carrier thus restricted being slidable frictionally on said surface of said image retaining member so as to remove said toner on said surface of said image retaining member, wherein a gap D between said surface of said roller and said surface of said image retaining member, and a gap H between said surface of said roller and said restriction means satisfy the following relation:

$$0.4\ \text{mm} \leqq H \leqq D \leqq H + 0.4\ \text{mm}.$$

4,482,245
APPARATUS FOR MEASURING THE COLOR OF A BRILLIANT-CUT DIAMOND

Hideki Makabe, Muko; Toyoji Yamamoto, Tokorozawa; Yoshio Matsueda, Iida; Yasunori Ito, Iida, and Katsuto Yamada, Iida, all of Japan, assignors to Kalnew Optical Industrial Co., Ltd., Japan

Filed Nov. 26, 1982, Ser. No. 444,606
Claims priority, application Japan, Nov. 30, 1981, 56-193413
Int. Cl.³ G01J *3/46*
U.S. Cl. 356—30 **4 Claims**

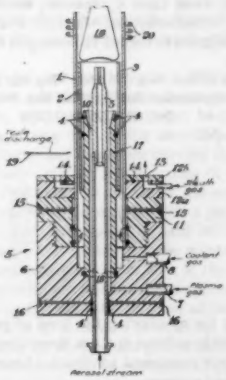


1. An apparatus for measuring a diamond color, comprising:
(a) a light source composed of a lamp and an integrating sphere for diffusing light therein emitted from said lamp;
(b) a diamond holder comprising (i) diamond supporting head means having in an upper portion thereof a pavilion hole for receiving the pavilion of a brilliant-cut diamond to be measured and a suction aperture extending from said pavilion hole to a lower portion thereof, and (ii) suction base means having on an upper portion thereof a tapered portion removably fitted in said diamond supporting head means for holding the diamond received in said pavilion hole under suction developed in said suction aperture, thereby positioning the table facet of the diamond in said integrating sphere for allowing the diffused light from the light source to fall on the table facet of the diamond;
(c) a monochromator for separating a beam of light as it emerges from the diamond through the table facet side into a spectrum;
(d) a photodetector for detecting the light from said monochromator;
(e) variable slit means disposed in at least one of said monochromator and said photodetector for adjusting the size of the beam of light to a diameter of the diamond;
(f) a measurement unit for controlling at least said monochromator to obtain a spectrum of the light which has passed through the diamond; and
(g) an arithmetic unit for deriving tristimulus values X, Y and Z from said spectrum of the light from the diamond.

4,482,246
INDUCTIVELY COUPLED PLASMA DISCHARGE IN FLOWING NON-ARGON GAS AT ATMOSPHERIC PRESSURE FOR SPECTROCHEMICAL ANALYSIS

Gerhard A. Meyer, 2446 Ginter La., Midland, Mich. 48640, and Ramon M. Barnes, 109 Mount Warner Rd., Hadley, Mass. 01035

Filed Sep. 20, 1982, Ser. No. 420,681
Int. Cl.³ G01N *21/73*
U.S. Cl. 356—316 **10 Claims**



1. Apparatus for sustaining an inductively coupled non-argon plasma discharge in a flowing gas at atmospheric pressure, for dispersing sample for analysis in the plasma discharge, and for elemental analysis of the sample by emission spectroscopy, the apparatus comprising in combination:
(a) a plasma discharge containment tube, the inner diameter of which is between about 13 to 25 mm; a coaxial intermediate tube which is recessed within the containment tube and forms an annulus therewith; a coaxial central tube which forms an annulus with the inner surface of the intermediate tube;
(b) an induction coil coaxially about the containment tube; a radio frequency power source of no less than about 27.12 MHz operatively connected to the induction coil; an electronic impedance controller circuit operatively connected between said power source and induction coil to automatically or manually match the impedance of the

plasma discharge to the output impedance of the radio frequency power source;

(c) means supplyinq a non-arqon gas or a mixture of gases not containing substantial argon, and connected through a variable flow controller to conduit means for supplying at separately controllable flow rates, non-argon plasma gas to the annulus between the central tube and intermediate tube, and non-argon coolant gas to the annulus between the containment tube and intermediate tube, the gases being admitted tangentially to each said annulus; the central tube communicating with a device for supplying flowing sample laden carrier gas for analysis;

(d) electrical means to initiate a primary plasma discharge; a detector comprising a spectrometer in optical communication with the plasma discharge, and suitable for emission spectroscopic analysis of the emitted light of the plasma resulting from sample dispersed in the plasma discharge;

(e) said apparatus further defined by a configuration factor in the range critically of between about 0.92 to <1, the configuration factor being effective to permit the plasma discharge to be moved and spaced sufficiently from contact with any surface of the containment and intermediate tubes to prevent detrimental plasma discharge induced ablation of any said tube surface.

4,482,247

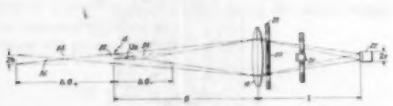
FORWARD SCATTERING LASER PARTICULATE SENSOR

Gerald Meltz, Avon; Leon A. Newman, South Windsor; James R. Dunphy, Manchester, and Martin C. Foster, Plantsville, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 376,861, May 10, 1982, abandoned. This application Jul. 8, 1983, Ser. No. 512,311

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—343 **5 Claims**



1. A sensor for monitoring the level of particulate passing through a sample volume in a gas flow, comprising:

a light source positioned to direct a beam a light through said sample volume;

a lens system including a first lens means positioned to collect light scattered from said sample volume;

a first photo detector means positioned in the image plane of said sample volume to receive light focused thereon by said first lens means from said sample volume for providing a first detector output signal proportional thereto; and

a spatial filter means, located within said beam of light and having an annular aperture whose inner and outer radii are sized to define limits of said sample volume, said spatial filter means including a second lens means positioned within a central aperture of the spatial filter means;

second detector means positioned to receive light from said second lens means for providing a second detector output signal proportional thereto such that the ratio between said first detector output signal and said second detector output signal indicates the particulate level in said sample volume.

4,482,248

INTERFEROMETER WITH A TUNABLE OPTICAL RESONATOR INCORPORATING A MONOMODE OPTICAL FIBRE AND APPLICATION TO FILTERING AND SPECTOGRAPHY

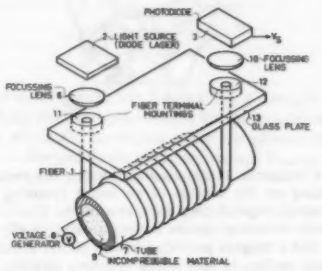
Michel Papuchon; Claude Puech, and Hervé Arditty, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 228,686, Jan. 26, 1981, abandoned. This application Feb. 17, 1983, Ser. No. 467,456

Claims priority, application France, Jan. 29, 1980, 80 01892

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—346 **6 Claims**



1. A tunable optical resonator comprising:

the combination of two partially reflecting and transmitting means and an optical monomode fiber positioned between said partially reflecting and transmitting means; and

means for varying the optical length of said resonator wherein said monomode fiber is wound on a cylindrical mandrel made of a piezoelectric material and electrodes are formed at the inner and outer surface of said mandrel and connected to a voltage source and wherein said mandrel is filled with an essentially incompressible material and wherein means are disposed to strain said mandrel in order to vary the optical length of said resonator.

4,482,249

ELECTROMAGNETIC WAVE RING RESONATOR

Irl W. Smith, Jr., Newton, and Terry A. Dorschner, Newton Center, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 141,873, Apr. 21, 1980, abandoned, which is a continuation of Ser. No. 936,164, Aug. 23, 1978, abandoned, which is a division of Ser. No. 646,308, Jan. 2, 1976, Pat. No. 4,110,045. This application Nov. 17, 1982, Ser. No. 442,473

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

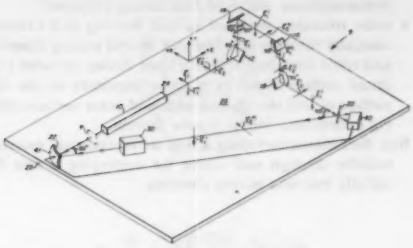
Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **15 Claims**

1. The method of producing different frequencies in an electromagnetic wave ring resonator comprising the steps of:

spatially rotating the electromagnetic field distribution of electromagnetic waves passing around said ring resonator about the direction of propagation of such waves while said waves pass through a non-solid medium providing a predetermined phase difference between a pair of resonant waves to produce such pair of the waves with opposite senses of circular polarizations and with different resonant frequencies; and

imparting different phase delays to said electromagnetic waves produced in said resonator with the same circular



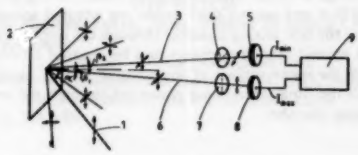
polarization sense and propagating in the resonator in opposite directions.

4,482,250

METHOD FOR IDENTIFYING TIMBER SURFACE PROPERTIES

Kullervo Hirvonen, and Aimo Karonen, both of Varkaus, Finland, assignors to Altim Control Ky., Varkaus, Finland

Filed Dec. 24, 1981, Ser. No. 334,085
Claims priority, application Finland, Feb. 10, 1981, 810371
Int. Cl.³ G01N *21/21*
U.S. Cl. 356—369 **1 Claim**



1. A method for determining timber surface properties, characterized in that substantially monochromatic, electromagnetical, linearly polarized radiation of the optical wavelength range is directed to the surface so that

(a) the polarization plane of the radiation coming to the surface is either parallel to the growth direction of the wood or perpendicular to it,

(b) the intensity components I_{min} and I_{max} having polarization planes of scattered radiation perpendicular to each other, are detected, wherein the polarization plane of the component I_{max} is the same as the polarization plane of the incident radiation,

(c) the quantities I_{min} and

$$P = \frac{I_{max} - I_{min}}{I_{max} + I_{min}}$$

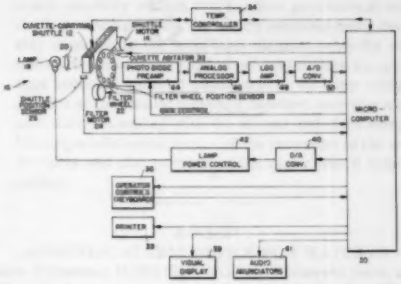
are both used in determining the quality of the surface and further characterized in that the incoming direction of the incident radiation and measuring direction of the scattered radiation deviate from the direction perpendicular to the surface about 15° at the most when measured in a plane parallel to the longitudinal growth direction of the wood and about 50° at the most when measured in a plane perpendicular to the longitudinal growth direction of the wood.

4,482,251

CLINICAL ANALYZER

Richard Saylor, Monsey, N.Y., assignor to Electro-Nucleonics, Inc., Fairfield, N.J.

Filed Oct. 19, 1981, Ser. No. 312,676
Int. Cl.³ G01J *3/50*
U.S. Cl. 356—418 **12 Claims**



1. In a clinical analyzer that includes a shuttle carrying a plurality of cuvettes containing liquid to be analyzed spectrophotometrically by a single beam spectrophotometer including a plurality of light filters, means for moving the shuttle past the spectrophotometer so that selected ones of said cuvettes are examined in a plurality of cycles of movement of each cuvette past the spectrophotometer to complete a test run, the improvement for calibrating the spectrophotometer circuitry comprising means for periodically completing a spectrophotometric reading of air only, including an attenuation circuit providing for varying signal attenuation to produce two air-only readings that together determine the slope of a calibration curve, and means for selectively activating said attenuation circuit.

8. In a clinical analyzer that includes a shuttle carrying a plurality of cuvettes containing liquids to be analyzed past a spectrophotometer, said spectrophotometer having gain control and including a lamp and a filter assembly containing a plurality of light filters, and means for moving the shuttle past the spectrophotometer so that selected ones of said cuvettes are examined in a plurality of cycles of movement of each cuvette past the spectrophotometer so that a plurality of said cycles complete a test for a group of said cuvettes, the improvement for adaptively calibrating the spectrophotometer circuitry comprising means active at least at the beginning of each test for completing a reference spectrophotometric reading of each of a plurality of said filters and adjusting said gain control for each filter to achieve a preselected spectrophotometric output, means for storing said gain adjustment for each filter, and means active thereafter during each cycle of testing during said test for adjusting said gain control so that it conforms to the value stored for a given filter when that filter is employed during said test.

4,482,252

CALIBRATION METHOD AND APPARATUS FOR OPTICAL SCANNERS

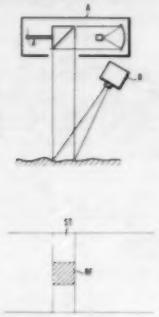
Dieter Lorenz, Hohenpeissenberg, Fed. Rep. of Germany, assignor to Deutsche Forschungs, und Verschsanstalt für Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Jan. 25, 1982, Ser. No. 342,084
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1981, 3102880
Int. Cl.³ G01N *21/55;* G01J *1/16;* G01D *18/00*
U.S. Cl. 356—448 **9 Claims**

1. Method of calibrating an optical scanner by comparison radiometry during operation thereof in space above the earth comprising the steps of:

disposing at least one radiometer for exposure to a signal from the same object, cloudscape or landscape from which a scanner to be calibrated picks up signals,

intermittently calibrating said at least one radiometer by exposing it to radiation from a standard radiation source while alternately exposing said at least one radiometer to



said source and to at least a part of said object, cloudscape or landscape, and

comparing the response of said scanner and the calibrated response of said at least one radiometer respectively relating to the same part of said object, cloudscape or landscape.

4,482,253

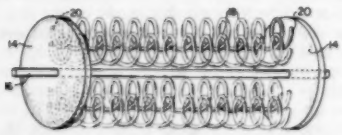
ROTARY MATERIAL PROCESSOR

Robert A. Golobic, and Lawrence J. Prosper, both of Colorado Springs, Colo., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Mar. 28, 1983, Ser. No. 479,290

Int. Cl.³ B01F *15/06*

U.S. Cl. 366—147 **26 Claims**



1. A rotary material processor comprising:

a pair of spaced manifolds:

an elongated rotatable shaft affixed between said manifolds:

a plurality of helical coils of multiple turns, said coils being formed of an element of circular cross section and said coils being of common length:

each said coil being affixed at one extent to one of said manifolds and at the other extent to the other of said manifolds, and being positioned aside said shaft.

4,482,254

FLUID MIXING APPARATUS AND METHOD

Erich Kessler, Hoechst, and Alfons Leeb, Kleinwallstadt, both of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Feb. 7, 1983, Ser. No. 464,560

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1982, 3204357; Jan. 14, 1983, 3301043

Int. Cl.³ B01F *7/24*

U.S. Cl. 366—177 **26 Claims**

1. An apparatus for mixing at least two fluids, and comprising

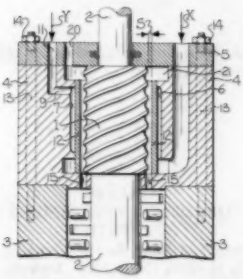
a housing,

a sleeve fixedly mounted in said housing and having an inner cylindrical surface which defines a first mixing chamber therewithin,

a second mixing chamber disposed in said housing in coaxial communication with said first mixing chamber,

a rotor rotatably mounted in said housing and extending coaxially through said first and second mixing chambers, said rotor including a mixing head having an outer cylindrical surface which is in close proximity to the inner surface of said sleeve, and with said outer surface including at least one helical groove therein,

first duct means including a first set of openings extending radially through said sleeve for conveying a first fluid radially into said mixing chamber,



second duct means including a second set of openings extending radially through said sleeve for conveying a second fluid radially into said mixing chamber, and

means for rotating said rotor relative to said sleeve and housing, whereby first and second fluids moving through said first and second duct means are adapted to radially enter the first mixing chamber through the respective first and second sets of openings and be sheared by contact with the outer surface of the rotating mixing head, and with the fluids then being conveyed through the second mixing chamber.

4,482,255

TIMEPIECE FOR DISPLAYING BOTH TIME AND ORIENTATION OF THE TIMEPIECE RELATIVE TO THE TERRESTRIAL MAGNETIC FIELD

Claude-André Gygax, Evilard; Pierre-Ernest Jaccard, Sonceboz, and Jean-Pierre Jaunin, La Neuveville, all of Switzerland, assignors to Omega, S.A., Bienne, Switzerland

Filed Oct. 27, 1982, Ser. No. 437,067

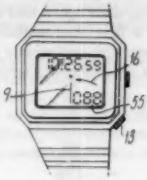
Claims priority, application France, Oct. 30, 1981, 81 20767

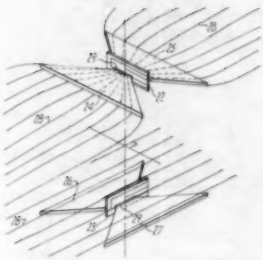
Int. Cl.³ G04B *47/00*

U.S. Cl. 368—10 **14 Claims**

1. An electronic timepiece including a display means arranged to display time data and orientation means sensitive to the direction and sense of the terrestrial magnetic field wherein said orientation means comprises a static detector and an electro-optic display arranged to display data from said detector, said timepiece further including a fixed axis wherein the data

displayed by said electro-optic display includes an independent digital indication of only the sense in which the display should





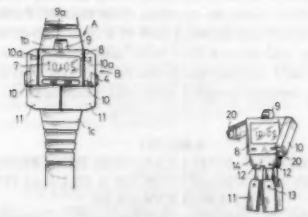
be turned in order to align said fixed axis with the terrestrial magnetic field in the most expeditious manner.

4,482,256

TOY WATCH

Takashi Matsuda, Tokyo, Japan, assignor to Takaro Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1983, Ser. No. 557,602
Claims priority, application Japan, Jun. 4, 1983, 58-85426
Int. Cl.[3] G04B *47/00, 45/00;* **A63H** *13/00*
U.S. Cl. 368—10 **23 Claims**



1. A reconfigurable toy watch assembly which is configured in a first position to simulate a compact watch assembly with an upper surface and outer perimetrical sides for mounting to a user's arm and in a second position to provide a robotic humanoid toy form comprising:

a wristband member;

a body member having an upper body surface;

means for displaying the time on the upper body surface of the body member;

a first member attached to the body member to provide a robotic humanoid head;

a pair of second members movably attached to the body member to provide respective robotic humanoid arms that are extendable from the body member in the second position, the second members and body member forming a portion of the upper watch assembly surface when the second members are moved to a position adjacent the body member so that the body member is positioned between the second members and the second members form outer perimetrical sides in the first watch assembly position, and

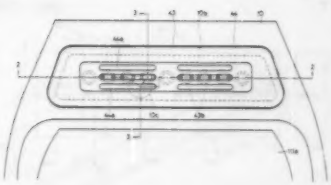
a pair of third members movably attached to the body member to provide respective robotic humanoid legs that are extendable from the body member in the second position, the third members forming another portion of the upper watch assembly surface and an outer perimetrical side in the first watch position, the watch assembly being detachably mounted to the wristband member whereby extension of the second and third members provides an appendaged robotic humanoid configuration for play while retraction of the second and third members provides a compact watch assembly with the second and third members forming a substantial portion of the perimeter of the watch assembly and also portions of the upper watch assembly surface.

4,482,257

ACOUSTIC ALARM DEVICE FOR WATCHES

Satoru Fukutome; Hideo Hatanaka, and Motoyuki Saito, all of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Division of Ser. No. 164,769, Jun. 30, 1980, Pat. No. 4,351,041. This application Jun. 28, 1982, Ser. No. 392,636
Claims priority, application Japan, Jun. 30, 1979, 54-89820; Jun. 30, 1979, 54-89821; Jun. 30, 1979, 54-89822
Int. Cl.[3] G04C *23/02, 21/16*
U.S. Cl. 368—88 **3 Claims**



1. An alarm device for a watch having a watch case, comprising a recess provided in an upper portion of the body of said watch case, a watertight sealing member provided in said recess, a vibration plate engaged with said watertight sealing member, a cover for said vibration plate, said cover having sound emanating holes and a leg portion provided on the periphery thereof, said watertight sealing member disposed between said leg portion and the inner wall of said recess, and means for frictionally securing said vibration plate, cover and watertight sealing member by flat surface frictional contact between said leg portion and said watertight sealing member and the wall of said recess.

4,482,258

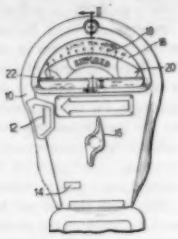
PARKING METER WITH LIMITED VISIBILITY POINTER

William C. Kiehl, Russellville, and James P. McEwen, Plainview, both of Ark., assignors to Deta Corporation, Russellville, Ark.

Filed May 2, 1983, Ser. No. 490,480
Int. Cl.[3] G04F *3/00*
U.S. Cl. 368—90 **7 Claims**

1. In a coin operated parking meter including a meter housing having a coin receiving slot and spaced transparent closure windows, a time dial with time indicia thereon mounted in the housing between the windows, the improvement of a translucent time indicating pointer pivotally movable from one end through an arc relative to the time dial in the housing and visible on a short range basis to the naked human eye when a

motorist is positioned near the meter for advising time available for parking and with the translucent time indicating pointer being relatively invisible to the naked human eye when



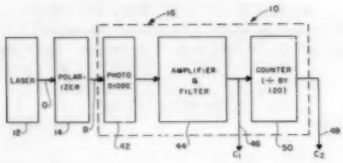
viewed by a person on a longer range basis such as from an adjacent street by a cruising motorist, and a swingable violation flag swingably mounted to arcuate movement when the translucent time indicating pointer falls to a zero time position.

4,482,259

LASER CLOCK

Roger L. Facklam, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1983, Ser. No. 498,238
Int. Cl.³ G04F *8/00, 5/00*
U.S. Cl. 368—118 **5 Claims**



1. A laser clock comprising:

(a) a frequency-stabilized linear laser utilizing an active medium in the form of a low pressure gas with a single Doppler broadened gain curve for generating a pair of output beams that are orthogonally polarized;

(b) means receiving said output beams so as to combine said polarizations and form a modified beam containing a beat frequency; and

(c) means for detecting said modified beam having said beat frequency and converting the same to a clock signal.

4,482,260

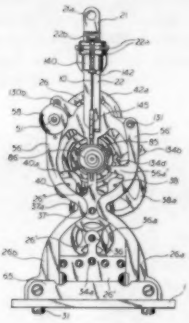
ELECTROMECHANICAL CLOCK

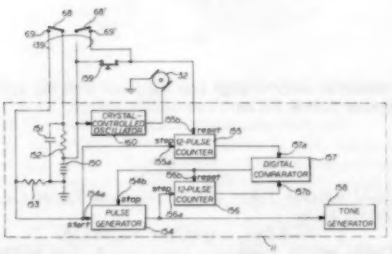
Wolfgang Fehrenbacher, St. Georgen, Fed. Rep. of Germany, assignor to Kieninger & Obergfell, St. Georgen, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,753
Int. Cl.³ G04B *17/02, 17/10*
U.S. Cl. 368—180 **33 Claims**

1. In a timepiece comprising a stepping motor, a clockwork driven by said motor including a gear train with a plurality of cascaded step-down stages mounted on a supporting structure, a horizontal minute shaft traversed by a seconds shaft and surrounded by an hour shaft, journaled in said structure, said gear train including a minute gear on said minute shaft, an hour gear on said hour shaft and a seconds gear on said seconds shaft, and a dial on said structure swept by a minute hand on said minute shaft and an hour hand on said hour shaft,

the improvement wherein said structure comprises a front upright and a rear upright parallel to each other bracketing said gear train therebetween, said motor being disposed at the bottom of said structure with a drive shaft in a vertical plane including the axis of said minute, hour and seconds shafts, said gear train including central gear means on a central shaft below said axis, first intermediate gear means on a first intermediate shaft coupling said central gear means with said minute gear, second intermediate gear means on a second intermediate shaft coupling





said central gear means with said seconds gear, said first and second intermediate shafts being laterally offset from said vertical plane on opposite sides thereof, further gear means on an axle forming part of a final step-down stage coupling said minute gear with said hour gear, said axle lying in said vertical plane above said axis, and a visibly moving member coupled with said seconds shaft.

4,482,261

METHOD FOR SIMULTANEOUS REFERENCE JUNCTION COMPENSATION OF A PLURALITY OF THERMOCOUPLES

Keith L. Dewey, Reynoldsburg, and Eugene C. Varrasso, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

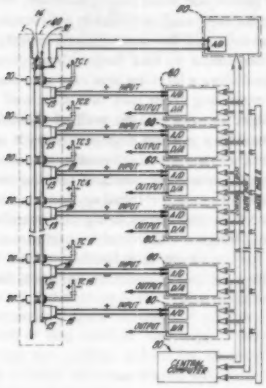
Filed Jul. 15, 1982, Ser. No. 398,491
Int. Cl.³ G01K *07/12, 01/20*
U.S. Cl. 374—181 **2 Claims**

1. A method for simultaneous reference junction compensation of a plurality of thermocouple signals comprising the steps of:

(a) terminating the thermocouple leads to jack assemblies, constructed of a material, different than the thermocouple leads which are electrically isolated, but thermally conductive to a metallic facepanel in which an integrated temperature transducer has been embedded;

(b) feeding the signal from the integrated circuit temperature transducer to an analog to digital converter which converts the signal from the integrated circuit temperature transducer into a digital signal;

(c) converting the digital signal with a microprocessor into a digital first signal which is representative of the temperature of the metallic facepanel;
(d) impressing the digital first signal from the microprocessor with a peripheral interface adapter upon a first data bus;
(e) feeding the thermocouple signals from the jack assemblies to an individual analog to digital converter for each thermocouple signal by a signal path that is composed of the same material as the jack assemblies;
(f) isolating, and digitizing the thermocouple signal with the analog to digital converter to form a digital thermocouple signal;
(g) converting the digital thermocouple signal into a second



digital signal representative of an uncorrected temperature with the microprocessor;
(h) reading the first digital signal from the first data bus by the microprocessor associated with the thermocouple signal;
(i) combining the first digital signal with the second digital signal with the microprocessor to produce a third digital signal representative of the corrected temperature sensed by the thermocouple;
(j) transmitting the third digital signal onto a second data bus by a peripheral interface adapter;
(k) converting the third digital signal into an output signal with a digital to analog converter; and
(l) transmitting the signal from the digital to analog converter to external field devices.

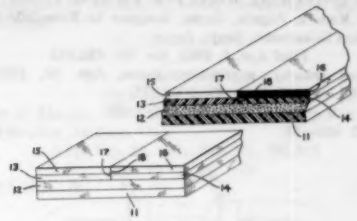
4,482,262

TRANSFER/CORRECTING RIBBON

Eugene Di Luco, 1760 Miriam St., North Brunswick, N.J. 08902

Continuation-in-part of Ser. No. 254,627, Apr. 16, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,495
Int. Cl.³ B41J *31/02*
U.S. Cl. 400—240.1 **4 Claims**

1. A transfer/correcting ribbon comprising,
a. a base strip made of relatively thin liquid impervious plastic material having a low tack adhesive on one surface thereof,
b. a first longitudinally extending length of relatively thin liquid impervious plastic material having a first width and a solvent ink formed and cured on one side thereof,
c. a second longitudinally extending length of relatively thin liquid impervious plastic material having a second width and a correction material formed and cured on one side thereof,
d. said first longitudinally extending length of solvent ink material and said second longitudinally extending length of correction material connected at the opposite sides thereof to the low tack adhesive on said one surface of said base strip by pressure, and in assembled position disposed in abutment with each other and said low tack adhesive covering the entire first and second widths of the respec-



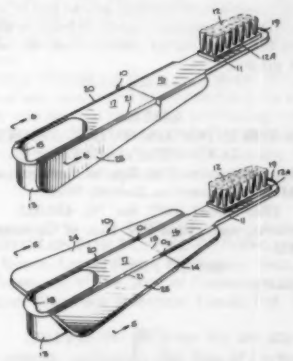
tive first and second longitudinally extending lengths of material, and
e. said first longitudinally extending length of solvent ink material and said second longitudinally extending length of correction material having the same thickness.

4,482,263

FOLDABLE TOOTHBRUSH AND TOOTHPASTE SUPPLY UNIT

Joseph P. Palamara, 43 Palmer Ave., Tenafly, N.J. 07670

Filed May 12, 1983, Ser. No. 494,030
Int. Cl.³ A46B *11/00*; **A45D** *44/18*
U.S. Cl. 401—191 **7 Claims**



1. A foldable brush and viscous ingredient supply unit comprising:
A. a generally-rectangular piece of semi-rigid synthetic plastic plate material having a strip extending from the longitudinal center axis at one end thereof;
B. a brush secured to the upper face of said strip; and
C. a trough integrated with the other end of the piece and depending therefrom at a position in line with the brush, said trough being dimensioned to accommodate said brush and a bed of the viscous ingredient to be applied thereby;
D. said piece having a transverse score line at its underface to create a living hinge dividing the piece into a brush section and a trough section foldable thereover to cause the brush to nest in said trough and to be partially immersed in said bed in the storage mode of the unit;
E. said piece having a pair of parallel longitudinal score lines at its upper face to create living hinges which define side flaps on either side of the trough, whereby in the operating mode in which the sections are unfolded, the flaps may

be bent down against the sides of the trough to define a substantially bar shaped handle for the brush.

4,482,264

UNIVERSAL JOINT FOR FISHING LINES

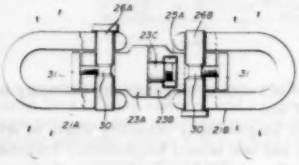
Yasuji Kodera, Nigata, Japan, assignor to Kabushiki-Kaisha Kodera Seisakusho, Sanjo, Japan

Filed Apr. 6, 1983, Ser. No. 482,683

Claims priority, application Japan, Apr. 30, 1982, 57-63717[U]; Aug. 9, 1982, 57-120901[U]

Int. Cl.³ F16D *3/00*

U.S. Cl. 403—58 **6 Claims**



1. A universal joint for fishing lines, comprising two U-shaped rods to be connected with two adjacent lines, a spindle for supporting said two U-shaped rods rotatably relative to each other, a pin for supporting one of said U-shaped rods oscillatably relative to said spindle, said pin passing through both legs of said one U-shaped rod to bridge said legs perpendicularly to the axis of rotation of said spindle, and a retaining means for preventing said pin from slipping off of said spindle and said one U-shaped rod, said retaining means comprising an engagement groove formed in the circumference of the center of said pin and a set-screw screwed into an end of said spindle such that its front end enters the cavity defined by said engagement groove but keeps out of contact from the wall of said engagement groove.

4,482,265

FASTENER FOR INTERCONNECTING VEHICLE DOOR LOCK COMPONENTS

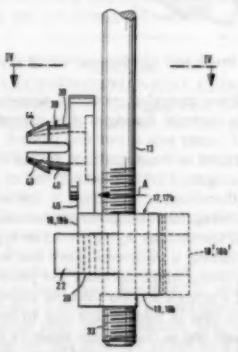
Manfred Koza, Raunheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1982, Ser. No. 438,033

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202433

Int. Cl.³ F16C *11/00*

U.S. Cl. 403—71 **5 Claims**



1. A fastener for adjustably connecting a threaded actuating rod to a door lock operating lever comprising, a pair of members of plastic material, each of said members having an abutting end wall, a remote end wall, and spaced side walls connecting said abutting and said remote end walls, each side wall of one of said members being respective to and paired with a side wall of the other of said members, each of said members including a partially threaded cavity in said abutting end wall thereof, said cavities opening to each other and cooperatively providing a threaded bore for threadedly receiving the rod when said members are assembled with said abutting end walls engaging each other and said respective paired side walls of said members being adjacent each other, first means interconnecting said abutting end walls of said members for locating said members in a direction transverse of said cavities and for securing said members to each other against movement in said transverse direction, second means interconnecting said adjacent respective paired side walls of said members on one side of said fastener for locating said members in a direction longitudinally of said cavities and for securing said members to each other against movement in said longitudinal direction, said second means including a latching arm on a side wall of one of said members extending from said one side wall through a groove in a respective paired side wall of the other of said members and having a portion engageable with said remote end wall of said other member, third means inteconnecting said adjacent respective paired side walls of said members on the other side of said fastener for locating said members in said longitudinal direction and for securing said members against movement in said longitudinal direction, and means on one of said members for attaching said fastener to the lever, said fastener providing the sole connection between the actuating rod and the operating lever.

4,482,266

BALL JOINT

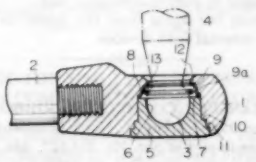
Shinji Kaneko, Kanagawa, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Oct. 19, 1982, Ser. No. 435,396

Claims priority, application Japan, Oct. 23, 1981, 56-158200

Int. Cl.³ F16C *3/00*

U.S. Cl. 403—135 **1 Claim**



1. A ball joint comprising: a socket member of synthetic resin and having a recess therein and opening out of said socket member and being for receiving the ball end of a ball member;

an annular plate member in said recess around the opening thereof and having a tapered cylindrical configuration with a radial inner flange on the small end and with the small end toward said opening; and

a retaining ring against the inside of said annular plate member;

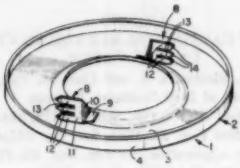
whereby when a ball end is in said recess, said retaining ring transmits the force of the ball end in a direction out of the recess to said annular plate member which in turn transmits it to said socket member for holding the ball end in said recess.

4,482,267

APPARATUS FOR MOUNTING A VENTILATION ELEMENT IN A VENTILATION CONDUIT

Lennart Widerby, Jonkoping, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Jan. 26, 1983, Ser. No. 461,152
Claims priority, application Sweden, Jan. 29, 1982, 8200488
Int. Cl.³ F16B 7/22
U.S. Cl. 403—377 7 Claims



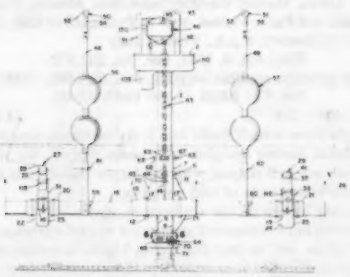
1. For mounting a ventilation element in the opening of a ventilation conduit in a wall surface, said ventilating element having a face plate adapted to confront the wall surface and an annular seat portion engageable in said opening, at least one anchor device having a base mounted on said element within the conduit, and a resilient wing diposed circumferentially of said annular portion substantially perpendicular to the face plate within said conduit and projecting from said base at one end and engaging the interior wall of said conduit at the other end, the other end portion of the wing comprising a plurality of tongues extending circumferentially generally parallel to the interior wall of said conduit, said tongues having at their free ends pointed tips angled outwardly to project substantially radially in relation to the centerline of said conduit so as to engage said interior wall.

4,482,268

BOAT LIFT

Ernest W. Stevenson, Danville, and Randall E. Nahas, Alamo, both of Calif., assignors to Levitator, Inc., Glenbrook, Nev.

Filed Oct. 13, 1983, Ser. No. 541,715
Int. Cl.³ B63C 3/06
U.S. Cl. 405—3 10 Claims



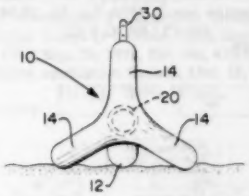
1. A boat lift comprising:
(a) a single stanchion load bearing member;
(b) a base plate connected to the top of said stanchion;
(c) a bracket member connected to said base plate laterally disposed from said stanchion members and adapted for connection to a stablizing member;
(d) a sleeve assembly slidably mounted on said stanchion member for travel thereon;
(e) a cross arm connected to said sleeve assembly and extending laterally substantially equidistant on either side of said stanchion;
(f) forward and aft fork members connected to said cross arm and disposed on opposite sides of said stanchion member;
(g) block means mounted on said forks adapted for cradling the hull of a boat;
(h) a lifting member connected to said sleeve assembly; and
(i) mechanical multiplying means connected to said lifting member.

4,482,269

SEAWALL BARRIER

Burton D. Morgan, Hudson, Ohio, assignor to Top Roc Precast Corporation, Hudson, Ohio

Filed Sep. 28, 1981, Ser. No. 306,512
Int. Cl.³ E02B 3/06
U.S. Cl. 405—29 3 Claims



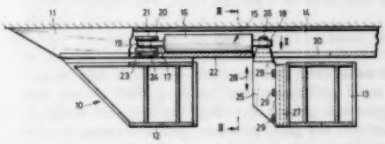
1. A seawall unit comprising:
a reinforced concrete structure including a shank portion and at least three diverging feet at one end of the shank portion, said feet being of such length and being positioned in relation to each other to retain, normally, two feet on the ground and said one end of said shank off the ground when the unit is placed on the ground with the other end of the shank and said feet positioned on the ground;
reinforcing wires in the shank portion and feet; and
certain of said reinforcing wires extending the length of said shank portion, and an annular reinforcing member is embedded in the concrete structure at the junction of said feet and shank portion; said wires extending out into said feet being threaded around said reinforcing member.

4,482,270

DRIVE SHIELDS FOR TUNNEL-DRIVING APPARATUS

Eberhart Unger, Lunen; Dieter Stuckmann, Selm, and Jürgen Hein, Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 24, 1983, Ser. No. 469,603
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206717
Int. Cl.³ E01G 3/02; E21D 19/00
U.S. Cl. 405—145 10 Claims



1. In a drive shield including a plurality of elongate hollow drive members (11) supported for longitudinal displacement on frame means (10), double-acting hydraulic rams (15) disposed within the drive members (11) for effecting relative displacement between the drive members and the frame means, and detachable connection means (19, 20, 21; 18, 25, 26) connecting the rams to the drive members and the frame means; the im-

provements comprising: the connection means including connectors (18) on the rams for receiving spigots (26) of coupling pieces (25), the coupling pieces being displaceable to introduce and withdraw the spigots from the connectors by radial movement relative to the interior of the shield, guides (27) provided on the frame means to locate the coupling pieces for such movement, and clamping means (29) for clamping the coupling pieces to the frame means to lock the coupling pieces in position with their spigots engaged in the connectors of the rams.

4,482,271

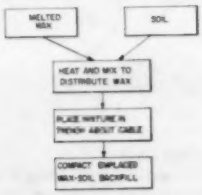
BACKFILLING MATERIAL AND METHOD OF PREPARATION THEREOF

James K. Mitchell, Moraga, and Tsung-chung Kao, Albany, both of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 846,918, Oct. 31, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 25,942

Int. Cl.[3] **H02G** *9/02*

U.S. Cl. 405—157 **6 Claims**



1. A method of treating the backfill in a trench around an electrical transmission cable buried in a substrate such as the earth for optimum conduction of thermal energy from the cable, including the steps of digging a trench in the substrate, placing the cable within the trench, and emplacing compacted mixture of soil and wax about the cable within the trench, said wax comprising at least about 2% by weight of the mixture.

4,482,272

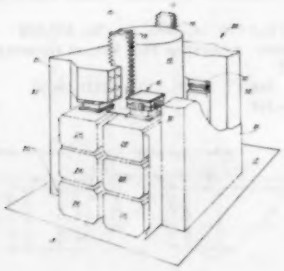
LOAD TRANSFER AND MONITORING SYSTEM FOR USE WITH JACKUP BARGES

Jean P. Colin, New Orleans, La., assignor to Ateliers et Chantiers de Bretagne acb, France

Filed Apr. 23, 1982, Ser. No. 371,305

Int. Cl.[3] **E02B** *17/08;* **C21D** *1/44*

U.S. Cl. 405—198 **32 Claims**



1. A load transfer apparatus for jackup barges, comprising:
a. a barge structure;
b. at least three legs movably attached to the barge structure;
c. a plurality of jacking mechanism means associated respectively with each of the legs for vertically moving each of the legs with respect to the barge structure;
d. pad means associated with each of the jacking structure means and placed between the jacking mechanism means and the barge for forming a load transfer interface between the jacking mechanism means and the barge transmitting the leg loads to the barge structure, the pad means comprising at least in part an inflatable pad having a hollow interior defined by an outer expandable wall for containing hydraulic fluid; and
e. conduit means penetrating the pad wall for transmitting hydraulic fluid to the hydraulic pad interior.

4,482,273

PROCESS OF CASTING OR REPAIRING CONCRETE UNDER WATER

Olav G. Tjugum, Slettmark 3, and Odd M. Tjugum, Charles Kings vei 9, both of 2050 Jessheim, Norway

Continuation of Ser. No. 73,190, Sep. 7, 1979, abandoned. This application Dec. 22, 1981, Ser. No. 333,301

Claims priority, application Norway, Sep. 14, 1978, 783105

Int. Cl.[3] **E02D** *15/06, 29/06*

U.S. Cl. 405—222 **19 Claims**

1. A process of casting concrete under water, comprising the steps of:
forming a formwork adjacent to and spaced from a surface to be cast with concrete, said formwork enclosing an area including said surface and containing water;
at least partially filling said area to between 3% and 25% of the volume thereof with a liquid plug-type material having low water solubility characteristics and a specific gravity greater than said water but less than cement-based concrete;
extending a tube within said area such that one end thereof is adjacent the bottom of said area below the surface of said plug-type material; and
filling said area with liquid concrete, having a sink factor of at least 20% and a specific gravity equal to or greater than 2.0, through the other end of said tube such that said concrete enters said area through said one end below the surface of said plug-type material, said plug-type material forming a barrier between said water and said concrete.

4,482,274

FLOATING PLATFORM FOR USE IN DEEP WATERS, AND METHOD OF INSTALLATION

Roberto Brandi, Padua; Giovanni Bucaneve, Mestre; Antonio Della Greca, Mestre; Gaetano Sebastiani, Mestre; Francesco Toffano, and Paolo Vielmo, both of Padua, all of Italy, assignors to Tecnomare, S.p.A., Venice, Italy

Filed Jul. 8, 1981, Ser. No. 281,372

Claims priority, application Italy, Jul. 15, 1980, 23442 A/80

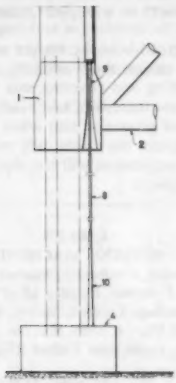
Int. Cl.[3] **B63B** *35/44;* **E02B** *17/00*

U.S. Cl. 405—224 **13 Claims**

1. A platform which floats in a body of water, comprising:
a platform having uprights with bores therein, the walls of which are bell shaped with the larger flared ends thereof at the lower ends of said uprights,
anchoring blocks on the sea bottom, and
anchoring lines connected at one end to said uprights and at the other end to said anchoring blocks wherein said anchoring lines are kept under a pulling stress by an excess of buoyancy of said platform, and wherein each of said anchoring lines comprises a steel tube having:
a hollow tapered bottom section secured to an anchoring block with its maximum diameter at said block,
a hollow central section of an essentially uniform diameter connected at its lower end to the upper end of said bottom section,,
a solid and tapered top section extending through a bell shaped bore in said upright and normally spaced from the outwardly flared walls defining said bore with the maximum diameter of said top section being at the point of connection to said upright, with its minimum diameter at the lower end thereof connected to said central

section, and with a decreasing flexural stiffness there between, and

the space between the outwardly flared wall defining said bore and said tapered top section being sufficient to



allow limited movement of said section until it bears against said outwardly flared wall, whereupon said walls limit further movement of and bending stresses on said anchoring line.

4,482,275

METHOD AND APPARATUS FOR DISTRIBUTING POWDERED PARTICLES

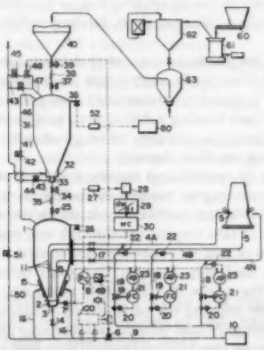
Yoshinobu Shinozaki, Yokohama; Yasuno Motozo, Ichihara; Iwamura Tadaaki, Chiba; Marushima Hironari, Mobara; Tagawa Yoshiteru, Ichihara; Takabe Ryoji, Chiba; Moriyama Takashi, Tokyo; Fujii Shuzo, Tokyo; Achiba Keiichi, Tokyo; Oishi Hideo, Tokyo; Yanagihara Yasuo, Tokyo, and Masuda Yoshiaki, Tokyo, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo and Denka Consultant & Engineering Co., Ltd., Tokyo, both of, Japan

Filed May 3, 1982, Ser. No. 374,313

Claims priority, application Japan, Dec. 12, 1981, 56-200349

Int. Cl.³ B65G *53/66*

U.S. Cl. 406—12 **12 Claims**



1. A method of continuously distributing and supplying powdered particles from a pressurized transporting vessel with a weight measuring device to a plurality of receiving ends through a plurality of transporting pipes for each of the receiving ends, each of said transporting pipes communicating a fluidized bed in the transporting vessel with the receiving ends, said method comprising the steps of:

controlling a speed of gas passing through the fluidized bed in the transporting vessel in accordance with a control signal depending upon a primary parameter of a weight changing ratio of the transporting vessel and upon a secondary parameter of an internal pressure of the transporting vessel, so that said speed of gas is continuously maintained substantially at a constant value; and

controlling a discharging rate of the powdered particles in each of the transporting pipes by individually controlling a flow rate of booster gas which is supplied into each of the transporting pipes.

4,482,276

AIR LOCK VALVE FOR PNEUMATIC CONVEYING SYSTEM

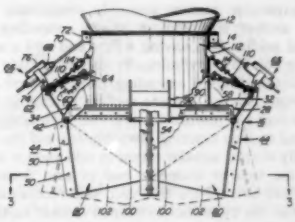
Joseph R. C. Chouinard, Pleasantville, Canada, assignor to Atlantic Bridge Company Limited, Nova Scotia, Canada

Filed Sep. 28, 1982, Ser. No. 425,913

Claims priority, application Canada, Oct. 13, 1981, 387777

Int. Cl.³ B65G *53/60*

U.S. Cl. 406—169 **6 Claims**



1. An air lock valve for use in a pneumatic conveying or handling system, comprising:

(a) an outline type frame adapted to be connected to the outlet of a separator chamber which, in use, operates under a negative pressure;

(b) a plurality of support arms pivotally connected to said frame in spaced apart relation thereabout and arranged for pivotal movement inwardly and outwardly relative to the center of the frame in planes passing generally through the center of said frame;

(c) stop means for limiting pivoting motion of said arms inwardly of the frame;

(d) means defining a plurality of flexible panels each having a top fastening margin, the top fastening margins of said panels being connected to and around said frame, a pair of opposed side fastening margins, each panel being connected between an adjacent pair of said arms with each side fastening margin being connected with that of an adjacent panel along an associated one of said arms in air tight fashion, each panel having a bottom edge which is free to flex;

(e) said flexible panels having a configuration such that under the influence of a negative pressure in the chamber during use, said arms are caused to pivot inwardly with the panels folding about lines extending from regions adjacent the outer extremities of the top fastening margin of each panel to a point mid-way along the bottom edge of the panel so that the panel is divided by the folds into an intermediate triangular area flanked by a pair of marginal triangular areas so that as the arms continue to pivot inwardly and reach the limit defined by said stop means, said marginal triangular areas of adjacent panels come together in face to face relation with one another, with the intermediate triangular areas together forming a pyramid-like configuration having an apex defined at the location where said points on the bottom edges of the panels come

together, the flexible panels being stressed substantially solely in tension under the influence of the air pressures thereon.

4,482,277

EXPANSION ANCHOR ASSEMBLY

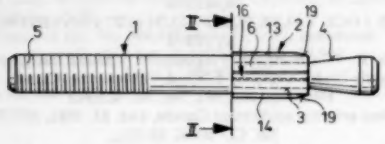
Erwin Schiefer, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 22, 1983, Ser. No. 468,368

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206290

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—42 **11 Claims**



1. An expansion anchor assembly comprising an axially extending anchor bolt and an axially extending expansion sleeve, said anchor bolt having a first end and a second end, said anchor bolt has a cylindrically shaped outside surface for an axial portion thereof extending from the first end, and a frusto-conicaly shaped outside surface extending from adjacent the second end toward the first end with said frusto-conically shaped surface tapering inwardly toward the first end, a cylindrically shaped annular recess in said anchor bolt extending from the smaller diameter end of said frusto-conically shaped surface toward the first end, said recess has a smaller diameter than the cylindrically shaped outside surface extending from the first end, said expansion sleeve is a hollow cylinder and is positioned in said annular recess and encircles said anchor bolt, said expanion sleeve has an inside surface and an outside surface and said expansion sleeve has an axially and circumferentially extending region in the inside surface thereof recessed outwardly from the surface of said annular recess forming a reduced thickness wall section acting as a predetermined breaking location for said expansion sleeve, wherein the improvement comprises that said inside surface of said expansion sleeve is cylindrically shaped and fits closely around said cylindrically shaped annular recess in said anchor bolt, in the circumferentially extending region of said reduced thickness wall section a projection is formed extending radially outwardly from the cylindrically shaped outside surface of said expansion sleeve.

4,482,278

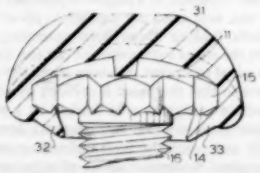
BOLT

James D. Dorn, Deerfield, Ill., assignor to Brock Manufacturing, Inc., Milford, Ind.

Filed Apr. 20, 1983, Ser. No. 486,689

Int. Cl.³ F16B *39/28*

U.S. Cl. 411—377 **1 Claim**



1. A bolt with a head and shank with a plurality of serrations formed about the periphery of said head, said serrations having the form of substantially equilateral triangles in cross section which extend radially outwardly from said head, a groove formed in the head underside adjacent said shank and extending radially outwardly to but not including the radial extremities of said serrations so as to form projections which extend from said head in the direction of said shank so that said projections will engage and hold the surface of a workpiece as the bolt is tightened against the workpiece, plastic encapsulating material surrounding and covering said head and said serrations for movement therewith, said plastic also being adapted to extend into said groove so that when the bolt is tightened against the workpiece the plastic will move further into said groove and said projections will bite through said plastic and engage said workpiece.

4,482,279

BINDING MACHINES

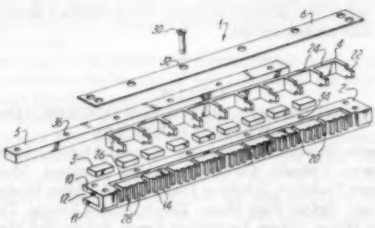
Leonard W. N. Jones, Camberley; Samuel D. Kandlekar, Woking, and Derek J. Archer, Reigate, all of England, assignors to James Burn Bindings Limited, Surrey, England

Filed Mar. 4, 1982, Ser. No. 354,759

Claims priority, application United Kingdom, Apr. 14, 1981, 8111828

Int. Cl.³ B42G *11/02*

U.S. Cl. 412—39 **7 Claims**



1. In a binding machine for binding a packet of perforated sheets together with a wire binding element, said element being formed from a length of ferrous metal wire bent to form a series of curved hairpin-shaped prongs with gaps in between, and said element being adapted to receive said sheets in impaled relation prior to closing said element into binding relation with said packet, the improvement comprising

a set of jaws movable relative one to the other for closing said binding element into binding relation with said packet,

a magnet bar located adjacent said jaws, said magnet bar being at least partly magnetized for holding said binding element in position between said jaws prior to closing said element into binding relation with said packet, said magnet bar having a plurality of longitudinally spaced openings along one face thereof,

a plurality of spaced stop members spaced along said one face of said magnet bar and extending from said one face thereof, said stop members protruding outwardly of said one face of said magnet bar through said openings so that free ends of said stop members are spaced from said magnet bar, said stop member free ends being adapted to engage the edges of said sheets along one edge of said packet for aligning the perforations of said sheets relative to the prongs of said binding element prior to said element being closed into binding relation with said packet and for maintaining alignment of at least a portion of said sheets as said element is closed into binding relation with said packet, and

a packet supporting table located adjacent said jaws, said table being adapted to position a packet of sheets in binding position between said jaws.

4,482,280

FEEDING APPARATUS FOR UNIFLOW REGENERATIVE SHAFT FURNACES FOR CALCINING LIMESTONE AND SIMILAR MINERAL MATERIALS

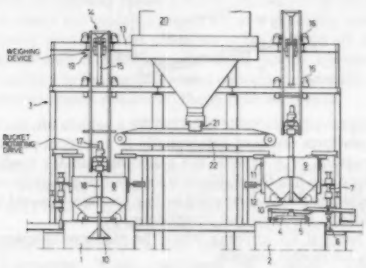
Erwin Füssl, Zurich, Switzerland, and Horst Waldert, Kaarst, Fed. Rep. of Germany, assignors to Maerz Ofenbau AG, Zurich, Switzerland

Filed Jan. 21, 1982, Ser. No. 341,476

Claims priority, application Switzerland, Apr. 23, 1981, 2667/81

Int. Cl.³ F27B *1/20*

U.S. Cl. 414—21 **1 Claim**



1. In a uniflow regenerative shaft furnace having two shafts for the calcining of limestone and similar raw materials, apparatus for charging said shafts alternately or simultaneously with the raw materials to be calcined comprising:

a pair of rotatable feed containers one located above each of said shafts for charging raw material into said shafts, each of said feed containers having an open top through which said containers may be filled;

conveyor means located to extend laterally between the open tops of said feed containers, said conveyor means being operative to feed raw material in opposite directions to deliver said raw material to the open tops of said feed containers;

valve means for each of said shafts for opening and closing flow of said raw material from said feed containers into said shafts, said valve means including a bell-shaped closure valve for opening and closing the bottoms of said containers;

a bin centrally located above said shafts substantially midway therebetween for delivering said raw material to said conveyor means, said bin including a single discharge device at the bottom thereof through which raw material is delivered onto said conveyor means;

a pair of hanger attachments one supporting each of said feed containers from above for raising and lowering said feed containers between a raised fill position and a lowered feed position;

weighing means in each of said hanger attachments for weighing said containers and the contents thereof; and

rotating drive means supported by said hanger attachments for turning said feed containers to maintain said feed containers in rotation during filling thereof with said raw materials.

4,482,281

PORTABLE ASPHALT STORAGE SILO

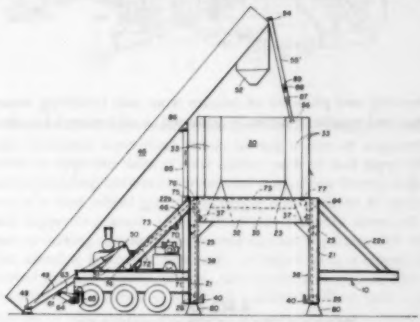
Joseph E. Musil, Ely, Iowa, assignor to Iowa Manufacturing Company of Cedar, Cedar Rapids, Iowa

Filed Dec. 1, 1982, Ser. No. 445,913

Int. Cl.³ B65G *67/08*

U.S. Cl. 414—332 **10 Claims**

1. In a portable storage silo for asphaltic concrete including a generally fore and aft extending wheeled framework for over-the-road transport of the apparatus, the framework having an upright bin supporting structure as a part thereof and defining a passageway through which trucks and the like can be driven in a direction transversely of the framework when the silo is in use, an asphaltic storage bin carried by the bin supporting structure, the bin being disposed in said passageway when the silo is being transported but elevatable relative to its supporting structure to an upper position in order to open said passageway when the silo is in use, the bin having an upper end for receiving and a lower end for discharging asphaltic concrete, an elongated conveyor having opposite inlet and outlet ends disposed in a generally fore and aft horizontal position on and carried by the framework when the silo is being transported, the conveyor also overlying the upper bin end, and means for elevating both the bin to its upper position and the conveyor to a final inclined position so that its inlet end is



adjacent the ground and its outlet end discharges into the upper bin end, the improvement wherein the elevating means comprises: fulcrum means carried by the framework and partially supporting the conveyor at a location intermediate its ends, the fulcrum means allowing both longitudinal movement of the conveyor in fore and aft directions relative to the framework and tilting movement of the conveyor between its horizontal and final inclined positions; first linkage means interconnecting the framework and the conveyor adjacent its inlet end; second linkage means interconnecting the bin and the conveyor adjacent its outlet end, the first and second linkage means being effective to allow and to control said movements of the conveyor; and power means operatively associated with the conveyor and the bin for elevating the same as aforesaid.

4,482,282

APPARATUS AND METHOD FOR SUPPLYING ARTICLES

Martin M. Wildmoser, Staten Island, N.Y., assignor to John Mueller, Northvale, N.J., a part interest

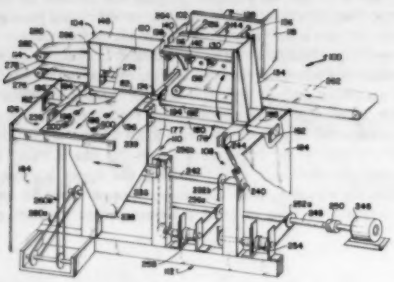
Filed Jan. 11, 1982, Ser. No. 338,608

Int. Cl.³ B65B *69/00*

U.S. Cl. 414—404 **24 Claims**

1. An apparatus for supplying articles provided in a carton, said apparatus comprising means for receiving a carton having a plurality of articles provided therein and for containing said articles upon withdrawl of said carton, means for arranging said receiving means in a first and second orientation, means for translating said receiving means between a first and second location, means for placing said carton into said receiving means when said receiving means is arranged in said first orientation at said first location, means for withdrawing said carton from said receiving means when said receiving means is

arranged in said second orientation wherein said plurality of said articles remain within said receiving means, and means for



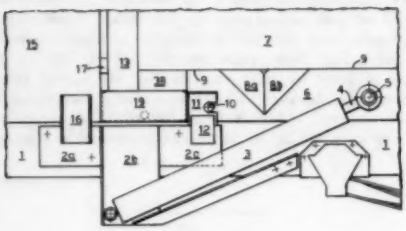
removing said plurality of articles from said receiving means when said receiving means is arranged at said second location.

4,482,283

REFUSE COLLECTING VEHICLES

Kenneth Fröderberg, Blomstermåla, Sweden, assignor to Norba Aktiebolag, Blomstermala, Sweden

Filed Apr. 28, 1982, Ser. No. 372,557
Claims priority, application Sweden, May 4, 1981, 8102769
Int. Cl.³ B65F *3/00*
U.S. Cl. 414—492 **12 Claims**



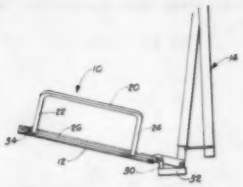
1. Improvement in refuse trucks and similar vehicles comprising a collecting container for waste or refuse, said collecting container being movable between first and second positions, loading hopper means for the waste or refuse, said loading hopper means being located adjacent the collecting container, said loading hopper means and said collecting container having mutually registering openings in adjacent confronting walls, and means for compressing the waste or refuse and transferring it from the loading hopper means to the collecting container through said mutually registering openings, wherein a spill box is provided under that end of the collecting container which is adjacent to the loading hopper means for catching refuse displaced from between said collecting container and loading hopper means during relative movement of the collecting container and loading hopper means, said spill box having an open top, said open top being at least substantially covered by said collecting container end when the collecting container is in sad first position and being substantially uncovered when said collecting container is in said second position.

4,482,284

AUTOMATIC HAND RAIL

Bobbie L. Robbins, and Gary L. Norton, both of Hutchinson, Kans., assignors to Collins Industries, Inc., Hutchinson, Kans.

Filed Oct. 21, 1981, Ser. No. 313,389
Int. Cl.³ B60N *3/02*
U.S. Cl. 414—539 **5 Claims**



5. An improved retractable hand rail for a vehicle lift, the lift having a platform disposed substantially in a vertical position in door opening of a vehicle, the platform used for loading objects thereon when the platform is lowered into a horizontal position adjacent the door opening or to a position adjacent the ground surface, the hand rail comprising:

a hand support for gripping when the platform is lowered into a horizontal position;

a first post having an upper end portion attached to one end of the hand support and a lower end portion;

a second post having an upper end portion attached to the other end of the hand support and a lower end portion;

a pivot shaft attached to the platform and the lower end portions of the first post and the second post, the pivot shaft having a coil spring mounted thereon, the coil spring engaging the first post for biasing the posts and hand support downwardly into a lowered position on top of the platform;

a control cam mounted on one end of the pivot shaft; and

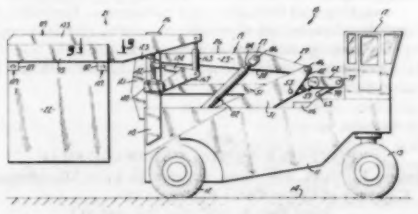
a receiver block mounted on the lift, so that when the platform is lowered the control cam is received and rotated in the receiver block, and movement of the control cam into the receiver block causes the cam and the pivot shaft secured thereto to rotate relative to said platform, thereby raising the hand support and the first and second post upwardly when the platform is lowered into a horizontal position.

4,482,285

LOAD CARRIER ASSEMBLY

Fernand Copie, Minneapolis, Minn., assignor to RayGo, Inc., Minneapolis, Minn.

Filed Aug. 12, 1982, Ser. No. 407,555
Int. Cl.³ B66F *9/14*
U.S. Cl. 414—589 **42 Claims**



1. A cargo container handling assembly useable with a mobile lift vehicle having lift means to move a cargo container to a desired location comprising: first means including support means, said support means comprises vertically movable supports, means operably connected to the vertically movable

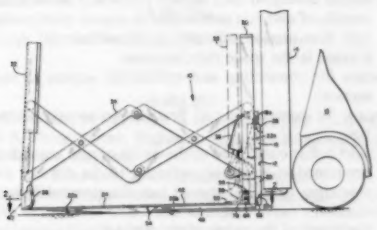
supports to selectively raise and lower said supports, spreader means having means adapted to be secured to the cargo container, said means connected to the supports operable to rotate the spreader means about a longitudinal horizontal axis to change the transverse slope of the container, strut means engageable with the support means and extended in a generally upright direction, means connecting the strut means to said spreader means, first power operated means connected to the support means to pivot the spreader means about a generally horizontal axis whereby the container can be selectively tilted in an upward or downward direction, second power operated means connected to the support means selectively operable to move the spreader means toward and away from the lift means and rotate the spreader means about a generally upright axis, thereby providing the container with fore and aft movement and skewed movements, and third power operated means connected to the support means operable to laterally move the spreader means relative to the mobile lift means.

4,482,286

FORKLIFT TRUCK PUSH-PULL SLIPSHEET HANDLER FOR FACILITATING CONVERSION OF TRUCK BETWEEN SLIPSHEET HANDLING AND PALLET HANDLING CAPABILITIES

Stanley E. Farmer, Corbett, Oreg., and Richard D. Seaberg, Vancouver, Wash., assignors to Cascade Corporation, Portland, Oreg.

Filed May 9, 1983, Ser. No. 493,141
Int. Cl.³ B66F 9/14
U.S. Cl. 414—607 **28 Claims**



1. A push-pull slipsheet handler adapted for rapid mounting and demounting with respect to a pair of transversely-spaced load-lifting forks having upwardly-facing load-supporting surfaces thereon, said forks being mounted on a vertically-movable lift truck carriage, said lift truck carriage being of the type having a transverse mounting member thereon having a downwardly-protruding portion, and said pair of forks having upwardly-opening hooks interlocked with said downwardly-protruding portion, said push-pull slipsheet handler comprising:

(a) a push-pull assembly including a frame, a push plate, power means for selectively extending and retracting said push plate with respect to said frame and selectively openable and closable jaw means on said push plate for gripping a slipsheet;

(b) platen means, connected to said frame, overlying said forks and extending transversely therefrom for supporting a slipsheet thereon, said platen means engaging said upwardly-facing load-supporting surfaces of said forks so as to be vertically supported by said upwardly-facing load-supporting surfaces; and

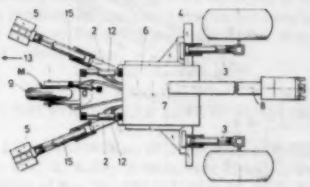
(c) engagement means on said frame of said push-pull assembly detachably matingly engaging said downwardly-protruding portion of said transverse mounting member of said carriage while said upwardly-opening hooks of said forks are interlocked with said downwardly-protruding portion of said transverse mounting member.

4,482,287

EXCAVATOR

Ernst Menzi, Widnau, Switzerland, assignor to Ernst Menzi AG, Widnau, Switzerland

Filed Apr. 30, 1982, Ser. No. 373,661
Claims priority, application Austria, May 15, 1981, 2173/81; Dec. 4, 1981, 5215/81
Int. Cl.³ E02F 9/08
U.S. Cl. 414—694 **7 Claims**



1. An excavating machine comprising a generally horizontally arranged supporting frame having a pair of supporting arms on opposite sides of said frame, each of said supporting arms extending outwardly from said supporting frame, at least one of a first wheel and a supporting foot secured to each of said supporting arms, a superstructure rotatably mounted on and extending upwardly from said supporting frame for rotation about a generally vertically arranged axis, a boom supported on said superstructure, said boom arranged to have a working tool positioned at its end outwardly from said superstructure, wherein the improvement comprises a second wheel mounted on said superstructure and movably displaceable in the vertical direction relative to said superstructure, at least one of said first and second wheels arranged to be driven, a supporting member vertically movably mounted on said superstructure for movement about a horizontal axis, said second wheel is pivotally mounted on said supporting member for pivotal movement about an axis located approximately vertically when said second wheel is in position for effecting wheeled driving movement of said machine so that by moving said supporting member about the horizontal axis said second wheel can be selectively placed in contact with the ground or moved vertically upwardly from the ground, and means for pivoting said second wheel about the approximately vertical axis for steering the excavating machine when said second wheel is in contact with the ground.

4,482,288

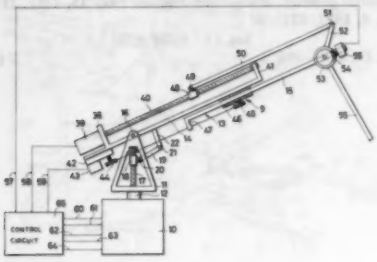
MECHANICAL ARM

Alberto Rovetta, Milan, Italy, assignor to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Sep. 1, 1982, Ser. No. 413,793
Claims priority, application Italy, Sep. 7, 1981, 23818 A/81
Int. Cl.³ B25J 11/00
U.S. Cl. 414—728 **3 Claims**

1. A mechanical arm consisting of a telescopable rod (13) comprising a guideway (14) and a slider (15), a sweeping extension (55), a supporting structure (11) and a base (10), the sweeping extension to which a tool assembly to be displaced is secured, being pivoted to the slider (15) of said telescopable rod (13), the guideway (14) of said telescopable rod (13) being pivoted to said supporting structure (11), which latter, in its turn, is rotatably supported (12) by the said base (10), the arm being characterized in that said supporting structure (11) is operatively connected to a first electric motor (23) by a rotary drive transferring mechanism (24, 25, 26, 27) and by a first clutch-brake unit (28, 29), said guideway (14) of the telescopable rod (13) being operatively connected to said first electric motor (23) by a first drive-transferring mechanism adapted to convert rotary motion (17, 18) into a translational motion and by a second clutch-brake unit (31, 32), the slider (15) of said telescopable rod (13) being operatively connected to a second

electric motor (39) by a second drive-transferring mechanism (40, 48) adapted to convert rotary motion into a translational motion and being operatively connected to a first brake (43) adapted) to lock in onto the guideway, said sweeping extension



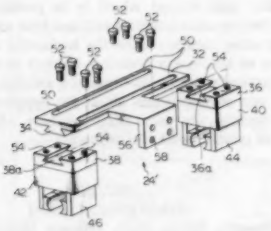
(55) being operatively connected to the same second electric motor (39) by the same second drive-transferring mechanism (40, 48) adapted to convert the rotary motion into a translational motion and being operatively connected to a second brake (56) adapted to lock it on said slider (15).

4,482,289

ROBOT HAND OF AN INDUSTRIAL ROBOT

Hajimu Inaba, Hino; Shinsuke Sakakibara, Kunitachi, and Ryo Nihei, Musashino, all of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed Sep. 4, 1981, Ser. No. 299,585
Claims priority, application Japan, Sep. 11, 1980, 55-125247
Int. Cl.³ B25J *15/00*
U.S. Cl. 414—736 **7 Claims**



1. A robot hand adapted for being attached to a free end of a robot arm of an industrial robot for manipulating longitudinally elongated bar-like work pieces comprising:

a base member having a flange portion for attaching said base member to said free end of said robot arm;

a pair of gripping members slidably attached to said base member for longitudinal movement thereon, each gripping member having transversely movable fingers enabling it to grip a bar-like work piece and to release the same;

manually operated means for sliding said pair of gripping members toward and away from one another in the longitudinal direction of the workpiece thereby establishing an adjusted distance between said pair of gripping members;

means for fixing said pair of gripping members to said base member at said adjusted distance; and

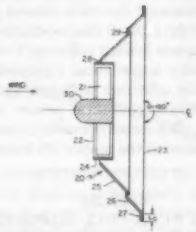
said flange portion being formed with a planar attaching surface which is perpendicular to the gripping movement of said gripping members.

4,482,290

DIFFUSER FOR AUGMENTING A WIND TURBINE

Kenneth M. Foreman, North Bellmore, and Barry L. Gilbert, Westbury, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 2, 1983, Ser. No. 471,567
Int. Cl.³ F03D *1/04*
U.S. Cl. 415—2 A **4 Claims**



1. In a diffuser augmented wind turbine, the diffuser comprising:

a cylindrical section for positioning the wind turbine therein;

a first divergent duct section positioned downstream and outside of said cylindrical section and in spaced-relationship with said cylindrical section whereby a circumferential opening is formed in the space therebetween;

a second divergent duct section positioned downstream and outside of said first section and in spaced-relationship with said first section whereby a circumferential opening is formed in the space therebetween;

means for connecting said cylindrical section to said first section;

means for connecting said first section to said second section;

a short collar connected to the outlet of said second section, positioned at least perpendicular to the diffuser axis and extending radially outward into the external flow;

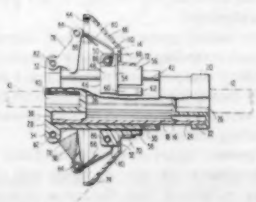
wherein the radial length of said collar is from 2% to 5% of the length of the radius of the outlet of said second section; wherein the axial length of the diffuser is equal to the length of the radius of the diffuser inlet; and wherein the ratio of the area of the outlet of said second section to the area of the inlet of said cylindrical section is from 2 to 4.

4,482,291

AUTOMATIC AIR INLET DAMPER

Shekhar Chakrawarti, Strongsville; Warren Delancey, Elyria, and Michael Haydn, Grafton, all of Ohio, assignors to R. W. Beckett Corporation, Elyria, Ohio

Filed May 6, 1982, Ser. No. 375,634
Int. Cl.³ F01B *25/00*
U.S. Cl. 415—25 **5 Claims**



1. An improved apparatus for controlling flow of air

through an aperture provided in an oil or gas burner of the type comprising a rotary member, said apparatus comprising:

an elongated flexible coupling member;

an elongated guide member having an axially extending central opening and a plurality of radially outwardly extending longitudinal lands;

first means positioned adjacent one end of said guide member for connection to the rotary member to cause said guide member to rotate therewith;

second means attached to said guide member for connection to one end of said coupling member, whereby said coupling member rotates with said guide member;

a slider member positioned on and adapted to slide along the exterior of said guide member on said lands, thereby minimizing the effect of accumulated oily residue and grit;

a closure member affixed to and extending radially outwardly from said slider member, said closure member being sized to block the aperture;

a first, weighted link pivotably mounted at one end at a point fixed relative to one of said guide member and said slider member;

a second link pivotably connected at one end to the other end of said first link, said second link being pivotably mounted at its other end at a point fixed relative to the other of said guide member and said slider member;

spring means operatively associated with said first and second links for biasing said links to force said closure member toward the aperture; and

means for connecting the other end of said coupling member to the rotary member.

4,482,292

Patent Not Issued For This Number

4,482,293

CASING SUPPORT FOR A GAS TURBINE ENGINE

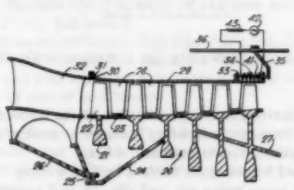
Derick A. Perry, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 2, 1982, Ser. No. 348,001

Claims priority, application United Kingdom, Mar. 20, 1981, 8108754

Int. Cl.³ F01D *11/00*

U.S. Cl. 415—219 R **9 Claims**



1. A casing support structure for a gas turbine engine comprising:

a load bearing outer casing;

an inner casing mounted within said outer casing;

a forward rotor bearing;

forward support means for maintaining a forward portion of said inner casing substantially concentric with said forward rotor bearing;

rearward support means supporting a rearward portion of said inner casing from said outer casing;

said rearward support means comprising a parallel motion linkage interconnecting said rearward portion of said inner casing and a section of said outer casing whose axis remains parallel to the axis of said forward rotor bearing when said outer casing is otherwise distorted in bending due to applied loads, said parallel motion linkage including a plurality of parallel, circumferentially spaced and axially entending links moveable parallel to each other to allow a degree of radial displacement between said inner casing and said section of said outer casing to maintain an axis of said inner casing parallel to the axis of said section of said outer casing in normal operating conditions;

and differential heating means for differentially heating said plurality of parallel links to cause said links to expand differentially and to displace said inner casing with respect to said outer casing to counteract the effect of distortions which produce an unequal clearance between said inner casing and a rotatable component just after shut down of the gas turbine engine.

4,482,294

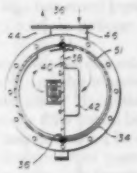
POWER UNIT FOR SINGLE LINE PNEUMATIC TUBE SYSTEM

Charles K. Kelley, and William W. Jones, both of Houston, Tex., assignors to C. K. Kelley & Sons, Inc., Houston, Tex.

Continuation of Ser. No. 038,167, May 11, 1979, Pat. No. 4,339,228, which is a division of Ser. No. 876,112, Feb. 8, 1978, Pat. No. 4,189,261. This application Apr. 23, 1982, Ser. No. 371,344

Int. Cl.³ F04D *25/12*

U.S. Cl. 415—219 R **8 Claims**



1. A power unit for alternately providing pressure of vacuum for a single line pneumatic tube carrier delivery system comprising a housing provided with acoustical padding, a drum-like pressure-vacuum chamber having a pressure port and a vacuum port mounted within the housing, the chamber being provided with acoustical padding, a longitudinally extending partition plate sealingly diametrically dividing the chamber into a pressure chamber and a vacuum chamber, at least one flow-through blower sealingly mounted in an aperture in the longitudinally extending partition plate, each chamber being provided with one of the ports, the pressure chamber being provided with the pressure port, the vacuum chamber being provided with the vacuum port, the blower extending through and being sealingly mounted in an aperture in the partition plate.

4,482,295

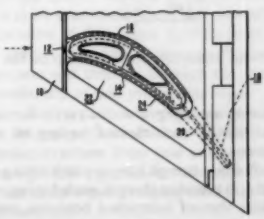
TURBINE AIRFOIL VANE STRUCTURE

William E. North, Concord Township, Delaware County, Pa., and Thomas M. Szewczuk, Claymont, Del., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1982, Ser. No. 366,625

Int. Cl.³ F01D *5/08*

U.S. Cl. 416—96 A **4 Claims**



1. An airfoil-shaped, hollow, turbine vane having a leading

edge wall, and a trailing edge portion with an exit air slot therein, and pressure and suction sidewalls and an internal cavity in communication with said exit air slot;

an impingement air insert located in the forward portion of said cavity and including a multiplicity of impingement ports through which cooling air received by said forward insert is jetted against said leading edge wall and said suction and pressure sidewalls;

a separate, aft insert in said internal cavity space betwen said forward insert and said trailing edge slot, said aft insert including spacer means on the exterior faces thereof in an interference fit with the facing walls of said vane to promote a closely-defined width channel between said aft insert and the facing walls, said aft insert including means operative to hold the walls of said aft insert outwardly towards said vane walls to maintain said closely-defined width in operation, said aft insert including a plurality of impingement ports located in the forward portion thereof and oriented to direct air received by said aft insert in a generally forward direction so that cooling of the suction and pressure sidewalls facing said aft insert is substantially wholly by a channel flow effect, the interior of said vane cavity between said inserts being unobstructed, and the leading edge wall and the suction and pressure sidewalls being imperforate so that all of the impingement cooling air from said forward insert and said aft insert is converted to channel flow cooling air along the sides of said aft insert;

said aft insert includes a double wall portion in the forward portion on the pressure side, the inner one of said double walls extending obliquely to the suction side wall in the rear portion of said insert, with spacer means between said forward double wall portion so that with the admission of air into said aft insert said forward inner wall portion of the insert flexes toward the pressure side to thereby maintain a closely dimensioned space for channel flow cooling at the suction side.

4,482,296

BLADED ROTOR ASSEMBLY AND METHOD OF FORMING SAME

Mark E. Wassell, Bloomfield, and John G. Mosimann, Ellington, both of Conn., assignors to Terry Corporation, Windsor, Conn.

Continuation-in-part of Ser. No. 321,338, Nov. 16, 1981,. This application Aug. 16, 1982, Ser. No. 408,228

Int. Cl.[3] **F01D** *5/22, 5/32*

U.S. Cl. 416—215 **28 Claims**

1. A bladed rotor assembly, for a turbine or the like, comprising:

a wheel;

said wheel having a periphery with a recess formed therein;

a plurality of blades, each thereof having an end which defines a root;

said recess defining a trough having confronting surfaces;

said blades, of said plurality thereof, each having surfaces on opposite sides thereof interposed between, and engaged with, said confronting surfaces;

at least one pair of said engaged confronting and side surfaces has means cooperative for retaining said blades in said trough;

said trough having means defining an access, for accommodating selective insertion and removal of said blade ends therethrough, for entry of said blade ends into, and withdrawal of said blade ends from, said trough; and

locking means, wholly confined within said trough, and in obstruction of said access, for preventing movement of said blade ends through said access; wherein

at least one of said blades has at least a portion thereof interposed between said locking means and said periphery to prevent removal of said locking means from said trough; and further including

packer means, engaged with said periphery and interposed between said blades of said plurality thereof, for uniformly setting apart said blades; wherein

said packer means comprises a plurality of bladespacing packers; and

all blades of said plurality thereof are identical and all packers of said plurality thereof are identical.

4,482,297

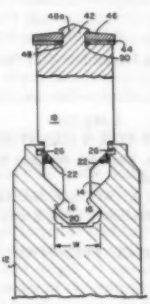
BLADED ROTOR ASSEMBLY

John G. Mosimann, Ellington, and Mark E. Wassell, Bloomfield, both of Conn., assignors to Terry Corporation, Windsor, Conn.

Filed Nov. 16, 1981, Ser. No. 321,338

Int. Cl.[3] **F01D** *5/10, 5/24*

U.S. Cl. 416—218 **17 Claims**



1. A bladed rotor assembly, for a turbine or the like, comprising:

a wheel;

said wheel having a periphery with a recess formed therein;

said recess having confronting surfaces extending fully circumferentially throughout said wheel;

a plurality of blades, each thereof having a root;

said blades roots being set, radially, in said recess with at least a minute clearance between said roots and said surfaces; and

means loosely interposed between at least one of said surfaces and at least a plurality of said roots for effecting damping both (a) between said one surface and said plurality of roots, and (b) between said roots of said plurality thereof; wherein

said damping means comprises means responsive to rotation of said wheel for forcing said damping means into a centrifugally-induced, damping, contacting engagement thereof with both (a) said one surface along at least a major circumferential continuum thereof, and said plurality of roots, and (b) in common with all of said roots of said plurality thereof;

said damping means further comprises means which, in response to movement of said roots with which it is centrifugally forced into engagement upon wheel rotation,

exhibits unitary movement thereof, circumferentially relative to said recess, fully throughout the whole length thereof, in concert with such movement of said roots, to cause frictional, sliding rubbing thereof on and along said one surface to effect damping of such roots movement;

said damping means further comprises a one-piece wire; and

said wire occupies more than half the circumferential length of said recess.

4,482,298

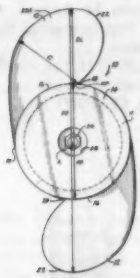
WEEDLESS PROPELLER

R. Douglas Hannon, 991 Eddings Rd., and George E. Lackman, 904 Simms Rd., both of Odessa, Fla. 33556

Filed Aug. 26, 1981, Ser. No. 296,329

Int. Cl.³ B63H *1/20, 1/26*

U.S. Cl. 416—234 **10 Claims**



1. A propeller for producing thrust upon rotation by a rotatable shaft within a fluid medium having a fibrous material therein, comprising:

hub means having an outer surface;

a plurality of blades;

each of said plurality of blades having a blade root, a leading blade edge, a trailing blade edge and a peripheral blade tip;

means connecting said plurality of blades to said hub means with said blade roots adjacent said outer surface of said hub means;

means for connecting said hub means to the rotatable shaft enabling said plurality of blades to produce thrust in the fluid medium upon rotation of said hub means about an axis of said hub means;

said hub means defining a hub diameter upon the rotation of a hub point disposed on said outer surface axially midpoint between said leading blade edge and said trailing blade edge of one of said blades;

said plurality of blades defining a blade length extending radially from said axis of said hub means between said hub diameter and a blade diameter defined by the rotation about said axis of the most distant poiny on said one of said blades;

each of said plurality of blades being swept back in a direction generally opposite to the normal rotation of the propeller with the majority of the surface area of each of said blades being disposed on one side of a radial line extending through said hub point; and

means establishing said hub diameter to be at least as great in linear dimension as said blade length of each of said plurality of blades.

4,482,299

WATER POWERED SUMP PUMP

David S. Eulass, 814 Fair La., Northbrook, Ill. 60062

Filed Aug. 25, 1982, Ser. No. 411,248

Int. Cl.³ F04B *49/04;* **F04F** *5/48*

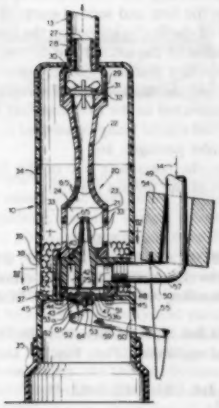
U.S. Cl. 417—54 **16 Claims**

1. A water powered sump pump having an ejector with an inlet end and a discharge end and provided with an intermediate propulsion zone, means for effecting communication of a continuous water pressure source with the intake end, and float controlled valve means for normally closing the inlet end and openable to permit the water pressure to enter the inlet end and effect operation of the ejector when a predetermined rise in water level occurs in an associated sump, the improvement comprising:

sump water intake structure arranged to direct sump water to flow into the structure through an entrance arrangement and then on through the structure substantially uniformly to the ejector, for ejection from said discharge end by operation of the ejector;

said intake structure having means for effecting turbulence in, and for progressively increasing the energy throughput and velocity of, the sump water as it flows from the entrance arrangement to the propulsion zone, so that maximum sump water pumping efficiency is attained;

and means in said propulsion zone for effecting turbulence and substantially eliminating boundary layer drag.



14. A method of pumping in a water powered sump pump having an ejector with an inlet end and a discharge end directed into an intermediate propulsion zone, and including effecting communication of a continuous water pressure source with said intake end, normally closing said inlet end with float control valve means, and opening said valve means and permitting water pressure to enter said inlet end and effect operation of the ejector when a predetermined rise in water level occurs in an associated sump, and comprising:

in the operation of the ejector causing sump water to flow into a sump water intake structure through an entrance arrangement and then on through the structure substantially uniformly to said propulsion zone;

effecting turbulence in and progressively increasing the energy throughput and velocity of the sump water into said intake structure from said entrance arrangement to and through said propulsion zone, and thereby attaining maximum sump water pumping efficiency by operation of said ejector; and

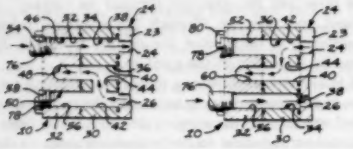
substantially eliminating boundary layer drag by effecting turbulence in said propulsion zone.

4,482,300

REVERSIBLE PUMP COUPLING APPARATUS

Robert E. Brown, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 17, 1982, Ser. No. 378,676
Int. Cl.³ F04B 19/00
U.S. Cl. 417—239 8 Claims



1. In a reversible pump coupling apparatus of the type for connecting a pump to a fluid source and to a user device, the pump defining first and second ports and interchanging the function of the respective ports from suction to pressurization upon reversal of the pump, the improvement comprising:

a first manifold defining first and second means respectively connected to the first and second ports of the pump in a first position of the first manifold on the pump and respectively connected to the second and first ports in a second position of the first manifold on the pump;

a second manifold defining first and second inlet passages and being connected to the first manifold and to the user device, the fluid source being connected to one of the first and second inlet passages; and

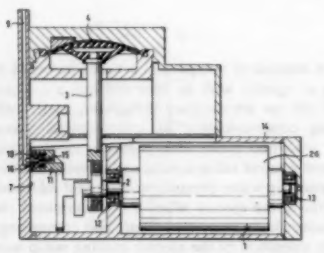
a plug blocking the remaining one of the first and second inlet passages of the second manifold.

4,482,301

VALVE CONTROLLED PUMP DRIVEN BY A MOTOR

Horst Schlick, Schwalbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 3, 1982, Ser. No. 384,816
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122722
Int. Cl.³ F04B 9/02, 35/02
U.S. Cl. 417—317 5 Claims



1. In a motor-driven valve-controlled pump having a 3/2-way valve by which two pump connections thereof can be connected, respectively, depending on a switch position of the 3/2-way valve, to a third, valve connection of the 3/2-way valve, the pump being driven by a motor, the improvement comprising

a direction detection means on the motor, said means being coupled with said 3/2-way valve for switching the latter, the motor has a motor housing which is mounted for limited rotation and is coupled mechanically to the 3/2-way valve for controlling said valve, said motor housing constitutes said direction detection means,

said 3/2-way valve includes a structural part having a control kidney, said structural part is connected to the motor housing,

said motor has a motor shaft which is mounted for rotation on both ends, said structural part engages against a stationary control surface of the pump containing the two pump connections during the limited rotation of the motor housing, said limited rotation being with respect to the control surface, and

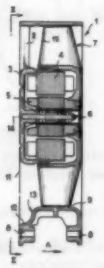
said structural part having the control kidney on a side opposite the control surface defines a pressure space communicating with pressure in the control kidney.

4,482,302

AXIAL ELECTRIC FAN OF THE FLAT TYPE

Robert Grignon, Verrieres Le Buisson, France, assignor to Etudes Techniques et Representations Industrielles E.T.R.I., Neuilly sur Seine, France

Filed Dec. 29, 1981, Ser. No. 335,570
Claims priority, application France, Jan. 9, 1981, 81 00257
Int. Cl.³ F04D 29/52
U.S. Cl. 417—354 12 Claims



1. In an axial electric fan of the flat type comprising a housing having an air admission face and an air outlet face, the housing having a cylindrical portion, a plurality of supporting arms carried by the housing, a casing centrally of the fan and carried by said arms, a motor within said casing, said motor having a shaft, and an impeller mounted on the shaft and cooperating with said cylindrical portion, the housing having a duct therethrough that is defined in part by said cylindrical portion, said duct on at least one said face of the fan housing having a larger area than the cross-sectional area of said cylindrical portion; the improvement in which the duct has on at least part of its periphery between said cylindrical portion and said at least one face of the fan housing a junction portion having an S-shaped profile in an axial plane, the ends of the S being substantially parallel to the axis of rotation of the shaft, said duct being progressively greater width from said cylindrical portion to said at least one face of the fan housing, said S-shaped profile of the junction portion having a point of inflection, said supporting arms extending from said casing to said junction portion and having a decreasing width at least from said point of inflection toward said impeller.

4,482,303

TURBO-COMPRESSOR APPARATUS

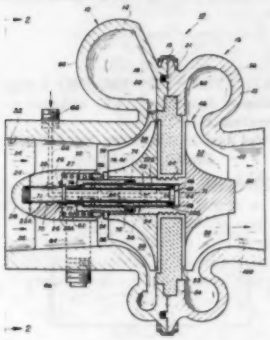
Ray Acosta, P.O. Box 541P, Bayshore, N.Y. 11706

Filed Jan. 27, 1982, Ser. No. 343,206
Int. Cl.³ F04B 17/00
U.S. Cl. 417—406 21 Claims

1. A turbo-compressor apparatus, comprising

(a) housings defining a turbine section and a compressor section;

(b) a non-rotating shaft supported axially in said apparatus;
(c) a sleeve bearing surrounding said shaft and having surfaces adapted to absorb radial and axial loads placed on said sleeve bearing, said sleeve bearing having openings therein;
(d) a rotation preventing means extending from the shaft through said openings to prevent rotation of said sleeve bearing while permitting said sleeve bearing limited axial motion with respect to said shaft;



(e) a rotor assembly rotatably mounted upon said sleeve bearing, said rotor assembly having a turbine wheel disposed within said turbine section and a compressor impeller disposed within said compressor section, said rotor assembly having a cylindrical axially extending opening defining a bearing surface adapted to receive said sleeve bearing; and
(f) a means for providing lubrication to said sleeve bearing to fully float said bearing with respect to said shaft and to reduce the friction between said sleeve bearing and said bearing surface.

4,482,304

COMPRESSOR OF A TYPE INCORPORATED IN AN EXHAUST GAS TURBOCHARGER

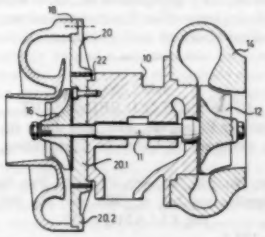
Helmut Brobeck, Hessheim; Hartmut Ludewig, Frankenthal; Wolfgang Miribel, Rodenbach, and Helmut Stönner, Frankenthal, all of Fed. Rep. of Germany, assignors to Aktiengesellschaft Kühnle, Kopp & Kausch, Fed. Rep. of Germany

Filed Sep. 17, 1981, Ser. No. 303,098

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036890; Aug. 6, 1981, 3131190

Int. Cl.³ F04D *29/66, 25/02*

U.S. Cl. 417—407 **10 Claims**



1. In a compressor for a turbocharger in which a compressor housing encloses a compressor wheel and includes an end wall which is fastened to a stator housing, and in which the stator housing rotatably mounts a drive shaft for the compressor wheel, the improvement wherein:

said end wall comprises a disc including an aperture receiving the drive shaft therethrough;
at least one ring generally coplanar with and disposed about said disc; and
a resilient ring between and connecting said disc and said at least one ring for deadening vibration and sound transmission through the compressor housing.

4,482,305

AXIAL FLOW APPARATUS WITH ROTATING HELICAL CHAMBER AND SPINDLE MEMBERS

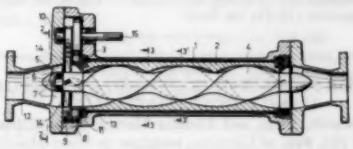
Lájos Nátkai, and Elek Ujfelusi, both of Budapest, Hungary, assignors to Országos Köolaj és Gäzipari Tröszt, Budapest, Hungary

Continuation of Ser. No. 350,050, Feb. 18, 1982, abandoned, which is a continuation of Ser. No. 185,131, Sep. 8, 1980, abandoned, which is a continuation of Ser. No. 970,321, Dec. 18, 1978, abandoned. This application Dec. 29, 1983, Ser. No. 565,848

Claims priority, application Hungary, Dec. 28, 1977, OA 583

Int. Cl.³ F01C *1/107*

U.S. Cl. 418—48 **5 Claims**



1. In a multi-purpose flow apparatus of the type which operates on the principle of volumetric displacement, the improvement comprising a casing having an inlet and an outlet disposed along a given line, an internally helicoidal chamber member rotatable about its center of gravity parallel to the given line and having z_k thread starts: an externally helicoidal spindle, and means mounting the spindle for rotation about an axis disposed at its center of gravity and parallel to the given line and comprising bearings and a fluid fluid flow guide cone for each bearing at the inlet and the outlet, wherein the spindle has $z_o = z_{k+1}$ thread starts, the thread division thereof is z_o/z_k times pitch of the chamber member and the angular velocity of rotation of the spindle is z_k/z_o times that of the chamber member.

4,482,306

PROCESS AND DEVICE FOR THE PRODUCTION OF ESSENTIALLY DRY MOLDINGS MADE FROM FOAMED THERMOPLASTIC, E.G. POLYSTYROL

Ortwin Hahn, Paderborn, Fed. Rep. of Germany, assignor to FLEWU AG, St. Gallen, Switzerland

Filed Dec. 3, 1982, Ser. No. 446,526

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151775; Oct. 7, 1982, 3237175

Int. Cl.³ B29D *27/00*

U.S. Cl. 425—4 R **2 Claims**

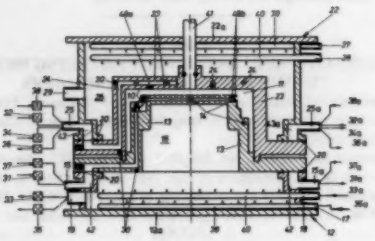
1. In a mold, for the production of moldings from particulate foamable thermoplastic resin, having:

(a) first and second mold components (**12;22**) each including a respective mold wall (**13;23**), said mold walls (**13;23**) together bounding a mold cavity (**11**), each said mold wall (**13; 23**) including respective passage means (**14;24**), for a fluid agent, communicating with said mold cavity (**11**), and each said mold component (**12;22**) including other wall means (**12***a; 22a*) bounding, with said mold wall (**13;23**), a chamber (**16;26**) to receive a fluid agent,
(b) an injector pipe (**41**), for inflow of particulate foamable material, opening into said mold cavity (**11**),

the improvement which comprises:

(i) each of said passage means (**14;24**) communicating with with mold cavity (**11**) through nozzle means (**48***b*;**48***a*) disposed in the respective mold wall (**13;23**),

(ii) each of said passage means (**14;24**) having a single flow connection (**15**; **25**) for both supply and removal of fluid agent, and



(iii) each of said chambers (**16;26**) being sealed with respect to said mold cavity (**11**), and having at least one inflow connection (**17,18;27,28**) for fluid and at least one outflow connection (**19;29**) for fluid.

4,482,307

PRESS FOR PRODUCING TRUE-TO-SIZE WORKPIECES USING POWDER MATERIALS

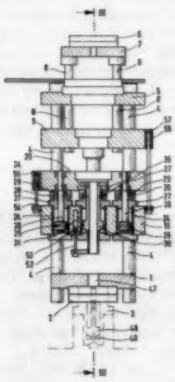
Hubert Schaidl, Bichl, and Dietmar Herren, Benediktbeuern, both of Fed. Rep. of Germany, assignors to Dorst-Maschinen und Anlagenbau Otto Dorst und Dipl.-Ing. Walter Schlegel GmbH & Co., Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 412,398

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142126

Int. Cl.[3] **B22F** *3/00*

U.S. Cl. 425—78 **12 Claims**



1. A press for producing finished to gauge workpieces by compacting powdered material, comprising:

a removable frame structure adapted to be mounted between and detachably secured to the upper and lower platens of a die press, said removable frame structure including:

a substantially horizontally disposed die plate having a die opening extending downwardly therethrough;

upper stamp means above said die plate for downward movement into said die opening;

lower stamp means below said die plate having at least three stamp parts, each of said stamp parts being independently movable upwardly and downwardly in said die opening, each of said stamp parts having top end faces designed for forming at least one downwardly directed face of a workpiece within said die opening;

a base plate below said lower stamp means;

lower stamp hydraulic means associated with said base plate for independently moving each of said stamp parts upwardly and downwardly in said die opening;

one stop for each stamp part for supporting each stamp part in a stationary position with respect to said base plate while pressing is taking place in said die opening;

means for vertically moving said die plate in relation to said base plate.

4,482,308

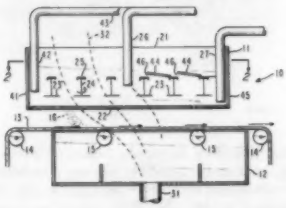
APPARATUS FOR FORMING DRY LAID WEBS

Jeffrey J. Johnson, Lynchburg, Va., assignor to The James River Corporation, Conn.

Filed Jan. 25, 1983, Ser. No. 460,986

Int. Cl.[3] **B29J** *1/00*

U.S. Cl. 425—83.1 **12 Claims**



1. An apparatus for depositing a uniform web of dry fibers onto a foraminous wire moving at speeds greater than 500 feet per minute in a horizontal upstream-to-downstream direction comprising:

a fiber distributor disposed above said wire, said distributor having a plurality of connected side walls a downstream wall, and a foraminous bottom wall, fiber inlet means for introducing dry fibers into the distributor and an air inlet at the top of the distributor, and means to disperse fibers onto the wire moving beneath the distributor;

a suction box disposed below said wire and offset from the relative position of the fiber distributor in the downstream direction of the moving foraminous wire; and

at least one inlet air deflector means located in the distributor above the dispersing means, said deflector means extending horizontally to cover between 10% to 40% of a horizontal cross section of the distributor, and positioned adjacent the downstream wall of the distributor for forming a zone of low pressure beneath said air deflector means wherein fibers introduced into the distributor acquire a horizontal velocity component in the downstream direction which is greater than the component would be in the absence of said inlet air deflector means.

4,482,309

DESENSITIZED SPINNERET

James E. Bromley, Pensacola, Fla., and John R. Dees, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 349,794, Feb. 18, 1982, Pat. No. 4,411,852. This application Jun. 6, 1983, Ser. No. 501,319

Int. Cl.[3] **A21C** *3/00*

U.S. Cl. 425—131.5 **4 Claims**

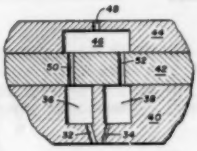
1. Melt spinning apparatus, comprising:

(a) a spinneret having a plurality of combined orifices, each said combined orifice comprising first and second capillaries; and

(b) means for substantially independently metering polymer volumetric flow through each said capillary;

(i) said means for metering polymer flow comprising a separate polymer metering passageway associated with each said capillary,

(ii) each said separate passageway being interposed between a pressurized comnon plenum polymer source and the said capillary with which each said passageway is associated,



(iii) each said passageway having dimensions selected to provide a pressure drop there across at least twice as large as the pressure drop across the said capillary with which each said passageway is associated,

whereby said polymer volumetric flows are substantially insensitive to variations in the dimensions of said capillaries.

4,482,310

APPARATUS FOR MANUFACTURING WRAPPED FOOD PRODUCTS

Torahiko Hayashi, 3-4, Nozawa-machi, Utsunomiya-shi, Tochigi-ken, Japan

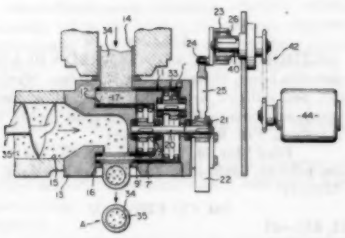
PCT No. PCT/JP82/00098, § 371 Date Dec. 2, 1982, § 102(e) Date Dec. 2, 1982, PCT Pub. No. WO82/03313, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 2, 1982, Ser. No. 451,144

Claims priority, application Japan, Apr. 2, 1981, 56-50177

Int. Cl.³ A21C *3/04, 11/04*

U.S. Cl. 425—132 **3 Claims**



1. An apparatus for manufacturing food products in which core materials are wrapped with crust materials, comprising an outside cylindrical assembly and an inside cylindrical assembly, each assembly having a substantially horizontal axis with the inside assembly positioned in the outside assembly, further comprising an annular passageway for crust materials which is formed between the opposite surfaces of cylindrical body portions of the outside and inside assemblies, each assembly comprising an outer tube and an inner tube which tubes are arranged so that the former abuts the latter and they can cyclically rotate in the opposite directions about their common axis, the outer and inner tubes of said outside assembly being provided at the respective body portions thereof with inlet and outlet apertures for the crust material, the two outlet apertures being adapted to co-operate with each other, while the outer and inner tubes thereof rotate, so as to periodically take an open position where the apertures are aligned to pass the crust material therethrough and a closed position where the flow of the crust material therethrough is interrupted, the outer and inner tubes of said inside assembly being provided at the respective body portions thereof with outlet apertures for the core material, the two outlet apertures being adapted to co-operate with each other, while the outer and inner tubes thereof rotate, so as to periodically take an open position where the apertures are aligned to pass the core material therethrough and a closed position where the flow of the core material therethrough is interrupted, the outlet apertures in said outside and inside assemblies being positioned in alignment with each other, said open and closed positions of the outlet apertures in said outside and inside assemblies, respectively, being synchronously taken.

4,482,311

BURNER WITH OXYGEN SHORTAGE SENSOR

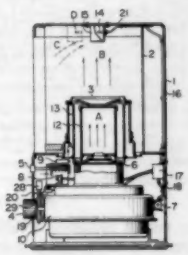
Chuzoh Wada, Nara, and Yoshikazu Matsuda, Sakurai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1982, Ser. No. 434,561

Claims priority, application Japan, Oct. 20, 1981, 56-168395; Nov. 4, 1981, 56-176868; Dec. 1, 1981, 56-193881; Dec. 3, 1981, 56-195191; Dec. 4, 1981, 56-195919

Int. Cl.³ F23N *5/24*

U.S. Cl. 431—15 **3 Claims**



1. A petroleum burner comprising:

an outer housing containing a fuel tank and having a front opening above said tank;

a wick for sucking up fuel stored in said tank, said wick being able to be moved by operation of a knob between an upper burning position and a lower extinguishing position;

a combustion cylinder, located over said tank and opposite to the front opening portion, for burning fuel evaporated from said wick;

a casing located directly above said combustion cylinder and said wick and attached on a lower surface of a roof plate of said outer housing, said casing having a lower opening;

an oxygen shortage sensor employing tin oxide located in said casing and producing a detecting signal representative of an oxygen shortage;

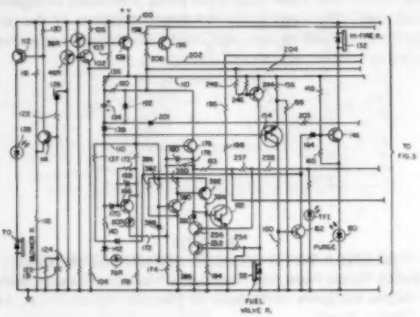
a baffle member provided in said casing and positioned in said opening for preventing direct intrusion of air from a periphery of said opening of said casing from impinging directly on said oxygen shortage sensor and affecting the detecting signal; and

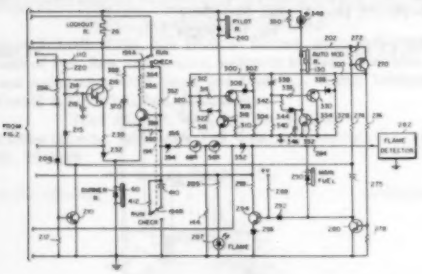
a control unit responsive to said detecting signal for generating a control signal to operate at least one of an external alarm means and a combustion-stopping means in response to said oxygen shortage sensor detecting a shortage of oxygen.

4,482,312
BURNER CONTROL SYSTEM

Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Jun. 20, 1979, Ser. No. 50,480
Int. Cl.[3] F23N *5/00*
U.S. Cl. 431—31 15 Claims





1. In a furnace system including a burner, a modulator for varying the output from the burner at least between a high fire position and a low fire position, an operating control, means for igniting the burner, and blower means responsive to the modulator for providing a variable air flow through the furnace, a burner control system comprising:

means responsive to operation of said operating control for applying power to said blower means;

means responsive to operation of said operating control for applying a signal to said modulator to cause said modulator to go to the high fire position following such operation;

capacitor means;

electronic circuit means responsive to operation of the operating control for controlling charge transfer to said capacitor means for timing a purge interval of a predetermined duration following such operation, said duration corresponding to predetermined voltage change on said capacitor means;

means responsive to the timing of said purge interval for applying a signal to said modulator to cause said modulator to go to the low fire position after the end of said purge interval;

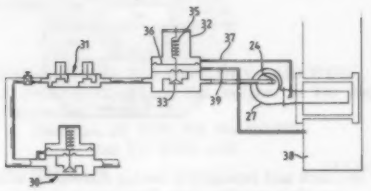
further charge transfer control means controlling charge transfer to said capacitor means for timing a second interval of a second predetermined duration which begins following the end of said purge interval; and

means for igniting the burner following the end of said second interval.

4,482,313
GASBURNER SYSTEM

Harry A. Cheetham, Broadstone, England, assignor to Stelrad Group Limited, Oxfordshire, England

Filed Jul. 26, 1978, Ser. No. 928,274
Claims priority, application United Kingdom, Jul. 27, 1977, 31589/77
Int. Cl.[3] F23N *1/02*
U.S. Cl. 431—89 2 Claims

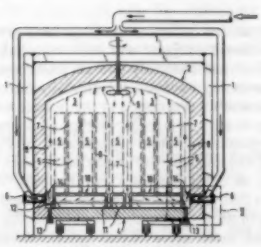


1. A gas burner comprising a member defining a duct closed at one end and open at the other, said member having a longitudinally extending perforated wall or wall portion, means for connecting the open end to a source of gas/air mixture under pressure, means within the member or forming part of the member for gradually reducing the volume of the duct from the open end toward the closed end so that in use of the burner a constant velocity of gas/air mixture is maintained within the duct to obtain a uniform static pressure on the outside of the perforated wall or wall portion where the gas/air mixture is burned, the open end of said duct being connected to the discharge duct of a fan provided with means for introducing gas under pressure to the air upstream of the fan rotor blades, the gas supply including in series a governor, solenoid-operated flow control valves and a zero governor controlled by pressure at the discharge side of the fan and pressure in the combustion region of the burner.

4,482,314
METHOD FOR HEATING CARBON BLANKS

Hans-Joachim Giese, Hanau; Walter R. Heiker, Wertheim-Sonderriet, and Wilfried Krohe, Bad Soden, all of Fed. Rep. of Germany, assignors to Sigri Elektrographit GmbH, Meitingen bei Augsburg, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 497,794
Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220121
Int. Cl.[3] F27B *3/02*
U.S. Cl. 432—11 5 Claims



1. In a method for manufacturing carbon bodies by heating blanks containing pyrolizable substances in a chamber oven which is heated from below 600° C. to above 600° C. and in which volatile pyrolysis products are formed and decomposed and thermal energy is generated by combustion of fluid fuel inside the chamber, the improvements comprising wherein

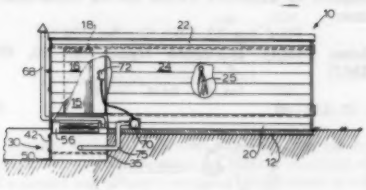
below a chamber temperature of 600° the fluid fuel is burned by supplying a stoichiometric amount of air, and above a chamber temperature of 600° C. an additional quantity of air is introduced into the chamber, wherein part of the pyrolysis products condense and precipitate, and wherein above the chamber temperature of 600° C., air is blown into the chamber in an amount sufficient to burn the precipitated pyrolysis products.

4,482,315

BULK TOBACCO BARN FURNACE

Harding W. Day, Rte. 4, Box 112, Roxboro, N.C. 27573

Filed Sep. 12, 1983, Ser. No. 531,446
Int. Cl.³ F27B *7/00*
U.S. Cl. 432—189 **4 Claims**



1. A bulk tobacco curing apparatus, comprising:

(a) barn structure extending lengthwise and establishing at one end and over a major portion of the length thereof a heating compartment and at the opposite end a furnace compartment and establishing a confined path for recirculating air therethrough, said barn structure being supported on the ground and in a manner and by means establishing a plenum chamber below said heating compartment and between said heating compartment and the ground and a basement chamber located below said furnace compartment, said basement chamber extending downwardly below the level of said plenum chamber;

(b) an individually controllable burner fired heat source in the nature of an oil- or gas-fired furnace located in said furnace compartment and operatively associated with said heating compartment and having an individually controllable associated electrically-powered fan for blowing air circulated along said path; and

(c) a wood-burning furnace located in said basement chamber below said oil- or gas-fired furnace, said wood-burning furnace having:

(i) a firebox;

(ii) an adjustably vented door for loading said firebox;

(iii) a heat exchange unit vertically spaced above said firebox, below said oil- or gas-fired furnace and in substantial vertical alignment with said fan and including sets of tubes connected at one end for receiving flue gases from said firebox and at the opposite exit end to vertically extending tubular exhaust stacks for exhausting said flue gases; said heat exchange unit being in flow communication with both said fan and said plenum chamber; and

(iv) an auxiliary electrically-powered blower apparatus having an adjustable thermostat control responsive to the temperature of said heating compartment, a blower and connecting ducts for receiving and admitting extra combustion air to said firebox;

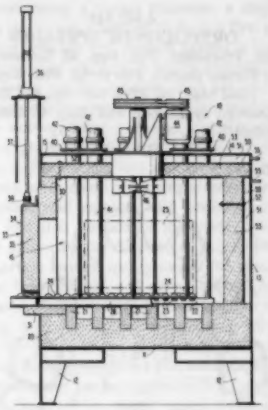
said wood-burning furnace heat exchange unit by reason of said location vertically below said fan and between said fan and said plenum chamber enabling heat created by said wood furnace to be employed to heat said heating compartment by flowing in said path.

4,482,316

INSULATED ATMOSPHERE FURNACE

William R. Keough, Bloomfield Hills, Mich., assignor to Atmosphere Furnace Company, Wixom, Mich.

Filed Jan. 7, 1983, Ser. No. 456,490
Int. Cl.³ F27B *5/04, 9/04, 3/22*; F27D *1/14*
U.S. Cl. 432—198 **3 Claims**



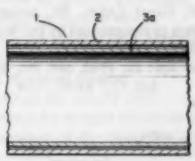
3. In a heat treatment furnace having an interior heat treatment space in which metallic articles are heated in a gaseous treatment atmosphere, the improvements of an insulating means partially defining said interior space and comprising a gas-tight exterior wall, a gas-permeable interior metallic wall spaced from said exterior wall to define a plenum chamber therebetween, a gas-permeable ceramic fiber insulation batt carried by said interior wall and coextensive therewith, said batt having its inner surface fully exposed to said heat treatment space, and means for injecting additional heat treatment atmosphere under pressure into said plenum chamber for flow through said interior wall and said insulation batt into said interior heat treatment space.

4,482,317

APPARATUS FOR COOLING A BODY

Harald Krogsrud, Gjettum, Norway, assignor to Elkem a/s, Oslo, Norway

Continuation-in-part of Ser. No. 217,688, Dec. 18, 1980,. This application Jul. 6, 1982, Ser. No. 395,693
Claims priority, application Norway, Dec. 18, 1979, 794122
Int. Cl.³ F27D *1/12, 3/02*; F28F *1/00*
U.S. Cl. 432—238 **6 Claims**



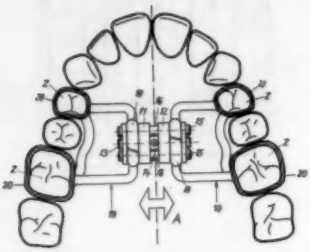
1. In a smelting furnace of the type for the production of ferro alloys, pig iron, carbide and the like having structural members which are cooled by passing a coolant liquid through one or more metal pipes attached to the structural members and wherein the temperatures generated in the furnace when operating are sufficient to cause at least some of the coolant liquid to vaporize, the improvement comprising a hose means

within said pipe, said hose means being of fibrous material and being permeable by the said liquid and being flexible towards and away from the internal wall of said pipe whereby the hose means contracts in response to gaseous pressure of the vaporized coolant liquid between the inside wall of said pipe and said hose means.

4,482,318
ORTHODONTIC SPREADER

Rolf Förster, Pforzheim, Fed. Rep. of Germany, assignor to Bernhard Forster GmbH, Pforzheim, Fed. Rep. of Germany

Filed Mar. 14, 1983, Ser. No. 475,351
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 8210086[U]; Jan. 20, 1983, 3301753
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—7 **13 Claims**

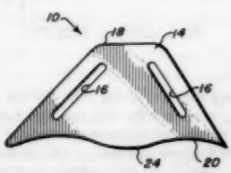


1. In an orthodontic spreader comprising
two pressure-transmitting nuts,
an actuating screw including two screw-threaded, oppositely handed end portions screwed into respective ones of said pressure-transmitting nuts, and
at least one guide rod, which is parallel to said screw and extends as a sliding fit through both said pressure-transmitting nuts,
the improvement residing in that
said actuating screw comprises an actuating portion between said screw-threaded end portions and
restraining means for axially restraining said guide rod are provided and comprise stops carried by said guide rod,
said actuating portion is laterally enlarged and
said guide rod is provided with an annular groove, said actuating portion engaging with said groove to limit the axial movement of said guide rod relative to said actuating portion.

4,482,319
MATRIX BAND INSET

Stanley J. Patch, Great Lakes, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 22, 1983, Ser. No. 487,666
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—39 **1 Claim**

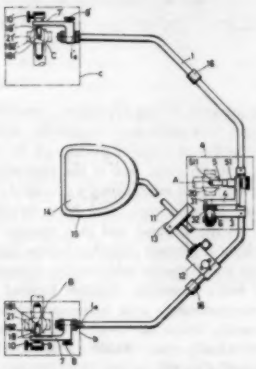


1. A dental inset for cooperative retainment about a tooth of an external matrix band having oppositely disposed end portions and comprising:
a generally planar member having wall thickness, the planar member being generally flexible about the thickness and contour conformable to an abuttingly engagable portion of the tooth,
a prefabricated shaped portion provided on the planar member generally fittable with engagable portions of the tooth and comprising a protrusion fittable into a complementary depression in the tooth, and
means for restraining the end portions of the matrix band.

4,482,320
FACE BOW OF THE MANDIBULAR MOTION DIAGNOSTIC DEVICE

Kenzo Katsoka, Otsu, and Minoru Imazato, Uji, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Apr. 12, 1983, Ser. No. 484,149
Claims priority, application Japan, Apr. 20, 1982, 57-58223[U]
Int. Cl.³ A61C *19/04*
U.S. Cl. 433—69 **2 Claims**



1. A face bow for a mandibular motion diagnostic device, said mandibular motion diagnostic device including a mandibular motion measuring device and a reproducing device, said mandibular motion measuring device being arranged such that its relative position with respect to a patient's mandible is kept constant throughout the time of measurement, and measuring the motion of three points set on a rigid plane representing said patient's mandible as the corresponding pieces of position information as a function of time, and said reproducing device being adapted such that there are provided three reference points for reproduction so set that their relative positions with respect to a mandibular model on an articulator are indentical with their relative positions with respect to said patient's mandible and said mandibular model is caused to reproduce the motion of said patient's mandible as motion of said rigid plane defined by said reference points for reproduction according to said position information;
said face bow being characterized in that:
it can extend around a patient's mandible and is set in a fixed positional relationship with said mandibular motion measuring device and is arranged to be shifted onto said mandibular model after the measurement is over and is provided with three spot light sources corresponding with said reference points for measurement which each emit light toward a respective one of said three points on said mandibular motion measuring device, said spot light sources being retained at the tips of retaining screws connected with said face bow and the

axes of respective retaining screws are rotatable up to 90° so as to be shiftable from a horizontal plane to be in a vertical plane and a dental dish filled with an impression material connected to be integral therewith so that when said face bow is shifted onto said mandibular model set on said articulator, said spot light sources agree with said reference points for reproduction.

4,482,321

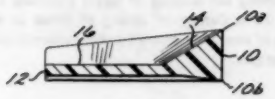
ORTHODONTISTS BRACKET REGISTRATION WAFER

Sam H. Tabor, 426 Mission Dr., Camarillo, Calif. 93010, and Bruce A. Tabor, 619 Del Oro Dr., Ojai, Calif. 93023

Filed Sep. 1, 1982, Ser. No. 413,742

Int. Cl.³ A61C *9/00*

U.S. Cl. 433—71 **4 Claims**



1. A bracket registration wafer accessory for use by an orthodontist to visually determine the relative positions of the teeth of a patient and brackets mounted on said teeth when the lower edges of said brackets are a substantial distance above the lower extremities of said teeth and provide a permanent record of such positioning, said accessory being a wafer of a generally semi-elliptical shape and of a size to permit the insertion of the wafer into the patients mouth between the upper and lower teeth, said wafer formed from a dimensionally stable but pressure deformable material, said wafer having upper and lower surfaces, said upper surface having a substantially flat central portion that develops into an outwardly disposed semi-elliptical marginal portion that slopes upwardly and outwardly relative to said central portion, said marginal portion of such size that when said wafer is gripped between the upper and lower teeth impressions of the upper teeth will be defined in said marginal portion of said upper surface adjacent said central portion, and said marginal surface portion and said lower surface cooperating to provide a body of said deformable material therebetween of sufficient thickness that when gripped between the upper and lower teeth of the patient relative deep impressions of the patients upper teeth are made in the marginal surface portion and such depth being to the extent that impressions of said brackets secured to said upper teeth are concurrently.

4,482,322

DEVICE FOR SURFACE TREATMENT OF TEETH

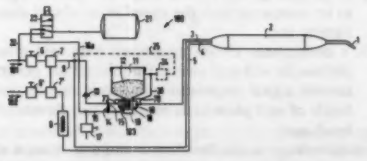
Josef Hain, Laudenbach, and Hermann Landgraf, Heppenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,095

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212207

Int. Cl.³ A61C *3/02*

U.S. Cl. 433—88 **16 Claims**



1. In a device for surface treatment of teeth having means for creating a gas stream containing an abradant, said means including a gas line extending from a compressed gas source to a nozzle, a reservoir for an abradant having a discharge orifice in communication with the gas line, pressurization means for applying a pressure to the interior of the reservoir including a pressure compensation line extending from the gas line to the reservoir and vibrating means coupled to the reservoir to vibrate the reservoir during operation of the device, the improvements comprising a vortex chamber, a diaphragm extending across the vortex chamber to form a first portion and a second portion with the first portion having at least an arcuate wall segment, said diaphragm being movable between a first position and a second position, said gas line having an incoming portion discharging at an incoming port into the first portion of the vortex chamber and an outgoing portion connected by an outgoing port to the first portion of the chamber and extending to the nozzle, said incoming port and portion and the outgoing portion and port being arranged to be tangential to said arcuate wall segment, said discharge orifice being positioned in said first portion of the vortex chamber at a position to be closed by the diaphragm in said first position, said second portion having spring means for biasing the diaphragm to the first position, and an air control line being in communication with the second portion, said air control line having venting means including a regulating valve for connecting the control line to the atmosphere and a branch line with a restriction interconnecting the air control line to the incoming portion of the gas line so that with a flow through the gas line and the control line being vented to the atmosphere, the diaphragm moves away from the first position to allow abradants to pass through the discharge orifice into the first portion of the vortex chamber for mixing with the gas passing therethrough.

4,482,323

DENTAL RESTORATIONS USING NOVEL PALLADIUM SILVER ALLOY CASTING

Stephen P. Schaffer, Bloomfield, Conn., assignor to The J. M. Ney Company, Bloomfield, Conn.

Division of Ser. No. 174,759, Aug. 4, 1980, Pat. No. 4,350,526. This application May 24, 1982, Ser. No. 381,551

Int. Cl.³ A61C *13/08*

U.S. Cl. 433—207 **4 Claims**

1. A dental restoration comprising:

A. a casting of an alloy consisting essentially of:

(1) 45–60 percent by weight palladium;

(2) 25–45 percent by weight silver;

(3) 3–15 percent by weight of a hardening and oxidizing component selected from the group consisting of tin, indium and mixtures thereof;

(4) 0.3–9.0 percent by weight zinc;

(5) 0.1–1.0 percent by weight silicon to substantially eliminate discoloration of the porcelain coating fired thereagainst;

(6) up to 0.5 percent by weight of a grain refining component selected from the group consisting of rhenium, iridium and mixtures thereof; and

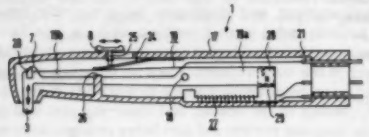
(7) up to 5.0 percent by weight of a modifying component selected from the group consisting of copper, magnesium, gallium, ruthenium and mixtures thereof; and

B. a porcelain coating upon a portion of said casting, said porcelain coating being substantially free from discoloration and firmly bonded to said casting.

4,482,324
PERCUSSION INSTRUMENT

Jürgen Wohlgemuth, Darmstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 30, 1983, Ser. No. 480,320
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215498
Int. Cl.³ A61C 5/00
U.S. Cl. 433—215 **15 Claims**

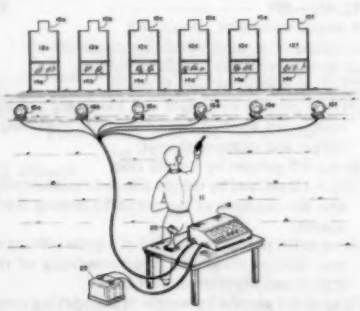


1. A percussion instrument comprising:
a housing;
a lever pivotally mounted in said housing at a center of gravity of said lever, said lever pivoting about an axis of rotation which is perpendicular to a longitudinal axis of said instrument, said lever carrying a test head at one end thereof extending perpendicularly relative to said longitudinal axis;
a drive means for accelerating said lever and said test head from an initial position to free flight at constant velocity toward an object to be tested by the reactive rebound of said test head there against;
an acceleration pickup comprised of at least one piezo-cereamic wafer disposed at a portion of said oscillating lever adjacent said test head, said acceleration pickup being mounted at a location such that a majority of the mass of said lever operates on said piezo-ceramic wafer as an inertial force upon impact of said test head against an object to be tested; and
an electro-magnetic means for acting on said lever to return said lever to said initial position after impact against said test object.

4,482,325
TARGET INDICATING AND SHOT SCORING SYSTEM FOR FIRING RANGE

Herbert Reimann, Sandston, Rte. 2, Box 204C, Sandston, Va. 23150

Filed May 20, 1982, Ser. No. 380,277
Int. Cl.³ F41G 3/26
U.S. Cl. 434—21 **10 Claims**

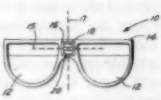


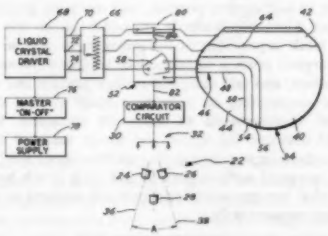
1. Control and recording apparatus for a firing range having one or more stationary targets for receiving bullets fired with live ammunition, comprising:
an electrical control circuit connectable to a power source and having a series of outlet connections connectable to a corresponding series of lighting means for causing indications of each period when a given target may be fired at,
means in the circuit to select one or more of said connections for controlling a desired number of targets,
means in the circuit to turn on power to said selected connnections one at a time and with intervals between, sensing means responsive to the sound of a shot, and
counting and recording means connected to the circuit and sensing means,
said counting and recording means having means to count and show a record of the number of shots that were sensed while any of the selected connnections was in off condition,
thereby providing a record of how many shots are fired during non-permitted periods, and thus providing a basis for modifying the scoring of target shooting to take into account the accuracy of timing of shots as well as the accuracy of aim determined by conventional inspection of hits on targets.

4,482,326
FLIGHT TRAINING GLASSES

Frank Witt, Columbia, S.C., assignor to Instrument Flight Research Inc., West Columbia, S.C.

Filed Jan. 26, 1982, Ser. No. 343,017
Int. Cl.³ G09B 9/00
U.S. Cl. 434—36 **7 Claims**



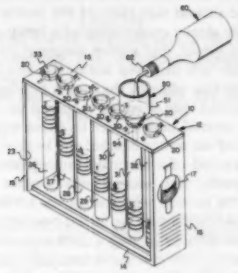


1. A pair of instrument flight training glasses for being worn by a student pilot including: a frame structure for mounting onto the head of the student pilot; a position sensor mounted to said frame structure; and a voltage controlled lens mounted to said frame structure;
A. said position sensor comprised of:
1. a pair of directional photocells to provide respective first and second directional signals, each directional signal having a signal level indicative of monitored level of light;
2. an ambient photocell to provide a threshold signal level to be compared with the signal level of said directional signals; and
3. a comparator circuit connected with said directional photocells and said ambient photocell for generating a control signal responsive to at least one of the signal levels of said photocells reaching said threshold signal level; and
B. said voltage controlled lens switching from a state of transparency to a state of opacity in response to said control signal whereby the glasses maintain operation despite obstruction of monitored light of one of said photocells.

4,482,327
APPARATUS AND METHOD FOR TRAINING A PERSON TO POUR PREDETERMINED QUANTITIES OF LIQUIDS INTO CONTAINERS

David A. Brady, 5024 Worth, Dallas, Tex. 75214

Filed May 10, 1983, Ser. No. 493,309
Int. Cl.[3] G09B *19/00*
U.S. Cl. 434—219 18 Claims



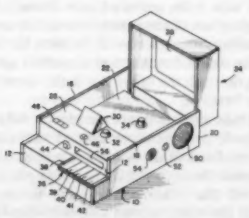
1. Apparatus for training bartenders and the like to free pour predetermined quantities of liquids from one ungraduated container into another ungraduated container, said apparatus comprising:

a plurality of graduated containers supported by a frame, each of said graduated containers including at least a primary volume indicating graduation for indicating the quantity of liquid received in said graduated containers, respectively, and at least a first set of secondary graduations on each of said graduated containers for indicating a first margin of error with respect to said primary graduations of the excess or insufficiency of liquid poured into said graduated containers, respectively, and volume indicating indicia associated with each of said graduated containers for relating the primary graduations on said graduated containers to the amount of liquid poured into said graduated containers, respectively, for training a person to accurately pour a plurality of different predetermined quantities of liquid.

4,482,328
AUDIO-VISUAL TEACHING MACHINE AND CONTROL SYSTEM THEREFOR

Frank W. Ferguson, 4837 S. 28th St., Arlington, Va. 22206; John F. Shell, Landover, Md., and Steven D. Hale, Vienna, Va., assignors to Frank W. Ferguson, Arlington, Va.

Filed Feb. 26, 1982, Ser. No. 352,917
Int. Cl.[3] G09B *7/06*
U.S. Cl. 434—310 25 Claims



1. An improved audio-visual apparatus for projecting spaced visual information segments and reproducing correlated audio information, comprising:

an audio-visual cartridge including a holder securing a plurality of visual information segments and a movable audio information storage medium carrying narrative and control data information in the form of encoded audio frequency bursts, said control data including information and instructions concerning the operation of the audio-visual apparatus in relation to succeeding narrative information;

a housing for receiving said cartridge;

optical means mounted in said housing for projecting one of said visual information segments;

holder drive means mounted in said housing for supporting said holder and for selectively driving said holder to align selected visual segments with said optical projecting means;

storage medium drive means mounted in said housing for supporting said storage medium and selectively moving said storage medium independently of said holder to enable the reproduction of recorded information therefrom;

sound producing means mounted in said housing for operative engagement with said storage medium and for reproducing said recorded narrative and control data information when said storage medium is moved by said storage medium drive means;

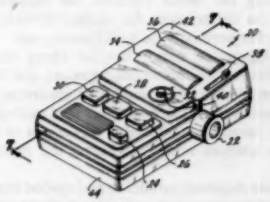
decoder means connected to said sound reproducing means to receive said control data information, said decoder means including means for converting said control data to corresponding digital data; and

control means including microprocessor means repsonsive to said digital data to operate said holder drive means and said storage medium drive means in accordance with the control data information and instructions carried by said information storage medium.

4,482,329
TEACHING TOY

Yasushi Shindo, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan

Filed Nov. 12, 1982, Ser. No. 440,826
Claims priority, application Japan, Jul. 1, 1982, 57-1144
Int. Cl.[3] G09B *3/00*
U.S. Cl. 434—342 12 Claims



1. A toy information indicating device which comprises:

a housing;

an indicia carrier means located on said housing, said indicia carrier means including a plurality of indicia units located thereon, said indicia carrier means movable on said housing allowing each of said indicia units to be viewable at least one at a time from the exterior of said housing;

control means located on said housing in operative association with said indicia carrier means, at least a portion of said control means movably mounted on said housing so as to move between a plurality of control positions, each of said indicia units of said indicia carrier means coordinated with one of said control positions, said portion of said control means movable between said plurality of said control positions in response to movement of said indicia carrier means;

test means located on said housing in operative mechanical association with said control means, said test means including at least a first test member and a second test member each of which is movable on said housing with respect to said control means to mechanically interact with said

control means so as for each of said positions of said movable portion of said control means one of said test members in moving with respect to said control means interacts with said control means in a first manner and the remainder of said test members in moving with respect to said control means interacts with said control means in a second manner;

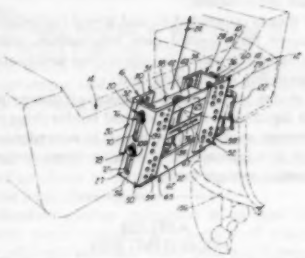
indicator means operatively associated with said control means and capable of indicating in which of said first or said second manners each of said test members interacted with said control means.

4,482,330

OUTBOARD MOTOR MOUNTING APPARATUS

Greg Cook, Duncan, Okla., assignor to Cook Machine Company, Duncan, Okla.

Filed Feb. 11, 1983, Ser. No. 465,807
Int. Cl.[3] B63H *21/26*
U.S. Cl. 440—2 10 Claims



1. An apparatus for mounting an outboard motor on the transom of a boat, comprising:

a transom bracket mountable on the boat transom;

a motor bracket, slideably mounted on the transom bracket, for receiving the motor thereon, the transom bracket disposible on the transom for sliding movement of the motor bracket vertically on the transom; and

means for sliding the motor bracket along the transom bracket whereby the motor can be raised and lowered on the transom via the motor mounting apparatus;

wherein the transom bracket comprises first and second side plates disposed parallel to the line of movement of the motor bracket on the transom bracket; wherein the motor bracket comprises:

a first side plate disposed parallel to and spaced from the first side plate of the transom bracket, the first side plate of the motor bracket having at least one slot formed therethrough parallel to the line of movement of the motor bracket on the transom bracket; and

a second side plate disposed parallel to and spaced from the second side plate of the transom bracket, the second side plate of the motor bracket having at least one slot formed therethrough parallel to the line of movement of the motor bracket on the transom bracket;

wherein the side plates of the transom bracket are characterized as having threaded holes formed therethrough in alignment with the slots formed through the side plates of the motor bracket; and wherein the apparatus is further characterized as comprising a bearing assembly comprising:

a first side bolt screwed into a threaded hole in the first side plate of the transom bracket and extending through a slot in the first side plate of the motor bracket;

a first side sleeve constructed of a lubricant impregnated organic polymer, said sleeve mounted on portions of the first side bolt disposed within the slot formed through the first side plate of the motor bracket;

a pair of first side washers mounted on the first side bolt, one first side washer to either side of the first side plate of the motor bracket and both first side washers constructed of a lubricant impregnated organic polymer, whereby one first side washer is sandwiched between the first side plate of the transom bracket and the first side plate of the motor bracket, the sandwiched first side washer having a thickness substantially equal to the spacing between the first side plates of the transom and motor brackets;

a second side bolt screwed into a threaded hole in the second side plate of the transom bracket and extending through a slot in the second side plate of the motor bracket;

a second side sleeve constructed of a lubricant impregnated organic polymer, said sleeve mounted on portions of the second side bolt disposed within the slot formed through the second side plate of the motor bracket; and

a pair of second side washers mounted on the second side bolt, one second side washer to either side of the second side plate of the motor bracket and both second side washers constructed of a lubricant impregnated organic polymer, whereby one second side washer is sandwiched between the second side plate of the transom bracket and the second side plate of the motor bracket, the sandwiched second side washer having a thickness substantially equal to the spacing between the second side plates of the motor and transom brackets.

4. The apparatus of claim 1 wherein the side plates of the motor bracket are characterized as having two slots formed therethrough parallel to the direction of movement of the motor bracket on the transom bracket and wherein the bearing assembly comprises:

two first side bolts screwed into threaded holes in the first side plates of the transom bracket, one first side bolt extending through one slot in the first side plate of the motor bracket and the other first side bolt extending through the other slot in the first side plate of the motor bracket;

two first side sleeves constructed of a lubricant impregnated organic polymer, one first side sleeve mounted on portions of one of the first side bolts disposed within a slot formed through the first side plate of the motor bracket and the other first side sleeve mounted on portions of the other of the first side bolts disposed within the other slot formed through the first side plate of the motor bracket; and

two pairs of first side washers, one pair of first side washers mounted on one of the first side bolts and the other pair of first side washers mounted on the other of the first side bolts, one first side washer of each pair to either side of the first side plate of the motor bracket and both first side washers of each pair constructed of a lubricant impregnated organic polymer, whereby one first side washer of each pair is sandwiched between the first side plate of the transom bracket and the first side plate of the motor bracket, the sandwiched first side washer of each pair of first side washers having a thickness substantially equal to the spacing between the first side plates of the motor bracket and the transom bracket;

two second side bolts screwed into threaded holes in the second side plate of the transom bracket, one second side bolt extending through one of the slots in the second side plate of the motor bracket and the other second side bolt extending through the other slot in the second side plate of the motor bracket;

two second side sleeves constructed of a lubricant impregnated organic polymer, one second side sleeve mounted on portions of one of the second side bolts disposed within a slot formed through the second side plate of the motor bracket and the other second side sleeve mounted on portions of the other second side bolt disposed within the other slot formed through the second side plate of the motor bracket; and

two pairs of second side washers, one pair of second side washers mounted on one of the second side bolts and the other pair of second side washers mounted on the other of the second side bolts, one second side washer of each pair to either side of the second side plate of the motor bracket

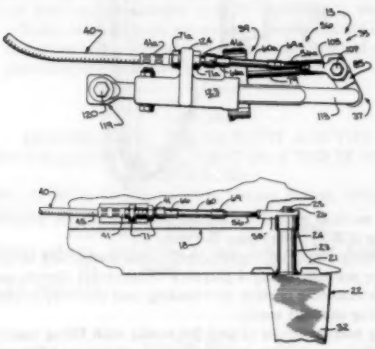
and both second side washers of each pair constructed of a lubricant impregnated organic polymer, whereby one second side washer of each pair is sandwiched between a second side plate of the transom bracket and the second side plate of the motor bracket, the sandwiched washer of each pair of second side washers having a thickness substantially equal to the spacing between the second side plates of the motor and transom brackets.

4,482,331

DAMPENER FOR VANE STEERING OF MARINE DRIVE

James Boda, Winneconne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 16, 1981, Ser. No. 321,758
Int. Cl.³ B63H *25/06*
U.S. Cl. 440—51 **1 Claim**



1. A steering system for a boat having a steerable marine drive including

a pendant drive unit selectively rotatable about a substantially vertical axis and having

a selectively driven propeller to provide steering thrust to said boat and

a pivotal vane selectively providing a portion of a surface within the slip stream of said propeller to apply a torque upon said vane surface and provide a turning movement to said drive unit and

a vane control arm connected to operatively control the rotation of said vane surface,

a selectively operable input member generally movable in a first direction to command rotation of said drive unit in a first direction and generally movable in a second direction to a command rotation of said drive unit in a second direction, and

a push-pull cable assembly connecting said input member to said vane control arm including

a first cable portion including an outer casing fixedly connected to said marine drive and an inner slidably movable core having first and second spaced ends axially movable in unison and

a second cable portion including

a housing having an axial opening providing a first opening portion having a first diameter to fixedly retain said outer casing and an axially spaced second opening portion having a second diameter smaller than said first diameter to slidably retain said inner core therein and

a rod having a first end fixedly connected to said first end of said inner core to axially move in unison therewith and a second end connected through a pivotal connection to said vane control arm and

a cylindrical sleeve surrounding the junction of said rod and said inner core including a first end portion connected to surround said and an axially spaced second end portion radially spaced from said inner core and providing an annular ridge retained within an annular groove provided by said housing within said second opening portion to permit substantial radial flexture of said rod and cylindrical sleeve with respect to said housing and first cable portion and

a third cable portion including

a housing having an axial opening providing a first opening portion having a first diameter to fixedly retain said outer casing and an axially spaced second opening portion having a second diameter smaller than said first diameter smaller than said first diameter to slidably retain said inner core therein and

a rod having a first end fixedly connected to said second end of said inner core to axially move in unison therewith and a second end pivotally connected to said input member and

a cylindrical sleeve surrounding the junction of said rod and said inner core including a first end portion connected to surround said and an axially spaced second end portion radially spaced from said inner core and providing an annular ridge retained within an annular groove provided by said housing within said second opening portion to permit substantial radial flexure of said rod and cylindrical sleeve with respect to said housing and first cable portion to control the rotative position of said steerable marine drive a dampening member operatively connecting said vane

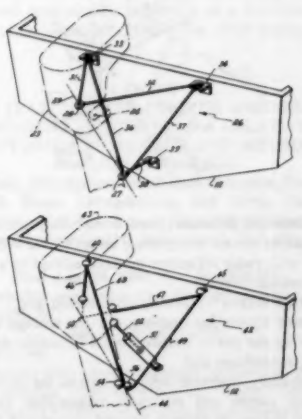
to said drive unit to restrain rapid rotation of said vane.

4,482,332

ARRANGEMENT FOR MOUNTING AND STEERING AN OUTBOARD MOTOR

J. Bruce Emmons, 2213 Sand Lake Rd., Lindenhurst, Ill. 60046

Continuation of Ser. No. 286,869, Jul. 27, 1981, abandoned. This application Jan. 27, 1984, Ser. No. 574,202
Int. Cl.³ B63H *25/42*
U.S. Cl. 440—53 **11 Claims**



7. A support structure for steerably mounting an outboard motor on a boat comprising means for attaching the support structure to a boat, means for pivotally attaching a lower portion of an outboard motor to the support structure, and means for attaching the support structure to an upper portion of an outboard motor with at least two movable portions of the support structure which, together with the means for pivotally attaching a lower portion of the outboard motor, constrain the outboard motor to rotate about a variable instantaneous steering axis which changes position as the outboard motor is rotated for steering on the support structure.

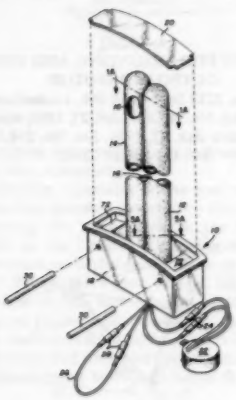
10. A mounting arrangement for an outboard motor on a boat comprising an outboard motor, having an upper portion and having a generally elongated lower portion including a substantially vertical drive shaft, and a support structure having means for attaching the support structure to a boat and means for pivotally attaching the outboard motor to the support structure for steering rotation of the motor about a steering axis which is angled upwardly and rearwardly and passes through or behind the center of gravity of the outboard motor.

4,482,333

AUTOMATIC INFLATION SYSTEM

Don W. Geri, Moss Beach, and Roy E. Hurtig, Saratoga, both of Calif., assignors to Geri Engineering, Inc., San Carlos, Calif.

Filed Apr. 30, 1982, Ser. No. 373,653
Int. Cl.[3] B63B *21/52*
U.S. Cl. 441—30 5 Claims



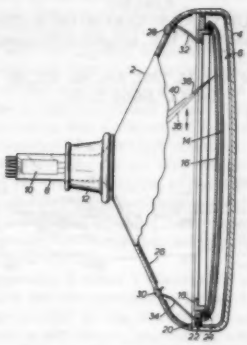
1. An automatic inflation system comprising, in combination;
an inflatable device comprising an inflatable radio-antenna mast with radar reflective material affixed to a portion of the surface thereof;
gas storage means for storing compressed gas;
an inflator means for opening the gas storage means and allowing the gas to transfer to the inflatable device;
a radio transmitter; and
an electrically operable initiator means for activating the inflator means and the radio transmitter, the initiator means having an electric control circuit and an initiator wire, and being constructed to activate the inflator means and the radio transmitter in response to interruption of the electrical continuity of said initiator wire, said electric control circuit including a delay means for delaying for an interval of time the opening of the gas storage means and the activation of the radio transmitter following the interruption of said initiator wire;
whereby severance of said initiator wire results in inflation of said radio-antenna mast with radar reflective material, and activation of said radio transmitter, thus providing an aid in a search for the automatic inflation system.

4,482,334

METHOD FOR MAKING CRT SHADOW MASKS

Yasuhisa Ohtake; Kazuyuki Seino, and Eiji Kamohara, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 19, 1982, Ser. No. 409,354
Claims priority, application Japan, Sep. 10, 1981, 56-141740
Int. Cl.[3] H01J *29/07*
U.S. Cl. 445—47 10 Claims



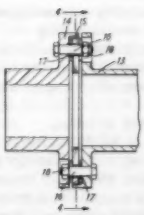
1. A method of making a mask arrangement for a cathode ray tube (CRT) comprising the steps of:
providing two (2) flat masks, each mask comprising an effective portion having a plurality of apertures therein and a non-effective portion surrounding said effective portion;
stacking said flat masks;
filling said apertures of said flat masks with filling material;
solidifying said filling material thereby fixing said flat masks together;
simultaneously pressing said fixed flat masks into a predetermined curvature; and
removing said filling material from the masks.

4,482,335

FLEXIBLE COUPLINGS

Edward W. Goody, Weybridge, England, assignor to Torsiflex Limited, England

Continuation of Ser. No. 177,466, Aug. 12, 1980, abandoned.
This application Apr. 5, 1983, Ser. No. 482,269
Claims priority, application United Kingdom, Dec. 18, 1979, 7943494
Int. Cl.[3] F16D *3/78*
U.S. Cl. 464—94 17 Claims



1. A flexible coupling for transmitting rotational drive comprising
first and second rotatable components connectable, respectively, to driving and driven devices; and
means for coupling said first and second components together in driving and driven relationship including
a radially rigid link having sufficient non-radial flexibility to

permit limited axial and angular relative movement between said first and second components,

means for connecting said link to said first component at a first plurality of angularly spaced driving locations and for connecting said link to said second component at a second plurality of angualarly spaced driving locations angularly offset from said first plurality of locations, all of said first and second pluralities of locations lying on substantially the same circle,

said link having a plurality of radially facing, axially extending bearing surfaces, and

first and second sets of radially facing, oppositely directed bearing surfaces on said first and second components, respectively, concurrently engaging said bearing surfaces on said link, said first and second sets directly contacting and extending axially from said first and second components, respectively, said bearing surfaces of each of said sets being fixedly positioned relative to one another,

all of said bearing surfaces lying in substantially the same cylinder, whereby said components are maintained in axial alignment without regard for wear at said first and second pluralities of locations.

4,482,336

HOMOKINETIC TRIPOD JOINT AND THE APPLICATION OF THE JOINT IN A WHEEL HUB STRUCTURE

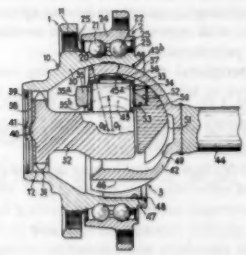
Michel A. Orain, Conflans-Ste-Ho Norine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Feb. 2, 1982, Ser. No. 344,934

Claims priority, application France, Feb. 9, 1981, 81 02465

Int. Cl.³ B60K *17/30*; F16D *3/30*

U.S. Cl. 464—111 **7 Claims**



1. A homokinetic tripod joint comprising a first element connected to rotate with a tripod element which defines three trunnions, three spherical rollers rotatably and slidably mounted on the trunnions, and a second element defining three runways in which runways the rollers are engaged, the first element and the second element defining respectively concave and convex complementary spherical surfaces which cooperate with each other for forming a ball and socket connection, a bayonet connection means between said first and second elements, said connection means including a plurality of recesses in the concave spherical surface of the first element, said connection means further including a plurality of segments on the convex spherical surface of the second element, which segments are adapted to pass through said recesses during assembly to form, upon relative rotation of said first and second elements, said bayonet connection means, the connection between said tripod element and said first element constituting an auxiliary coupling and including means defining complementary teeth which teeth are disengageable from each other by a relative displacement of the teeth axially of the joint, said joint further including an axial abutment element between said rollers and said second element, said abutment element having a convex spherical surface having a shape complementary to said second element, said second element being disposed between said first element and said abutment element.

4,482,337

UNIVERSAL JOINT

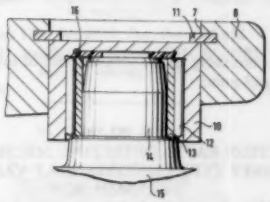
Miloslav Petrzelka, Much-Kranüchel, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft

Filed Dec. 17, 1981, Ser. No. 331,792

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048846

Int. Cl.³ F16D *3/26, 3/41*

U.S. Cl. 464—128 **9 Claims**



1. A universal joint comprising: first and second yoke means; trunnion cross means including bearing pin means supported in bores in said first and second yoke means joining said first and second yoke means together; bearing bush means, roller bearing means and bearing ring means provided in bearing engagement with each other over a length of bearing engagement between said bearing pin means and said yoke means; with at least one of said bearing pin means, said bearing ring means and said bearing bush means including means to provide over less than the full portion of said bearing length thereof and over only a part of their circumferential area radial play between said yoke means and said bearing pin means; said radial play gradually and continuously increasing in a direction radially outwardly of the center of the trunnion cross means.

4,482,338

TORQUE TRANSMITTING BEARING ASSEMBLY FOR MEMBERS ADAPTED FOR A RELATIVE LONGITUDINAL MOVEMENT AND METHOD OF ASSEMBLY THEREOF

Lothar Walter, Schweinfurt; Manfred Brandenteln, Eussenheim; Horst M. Ernst, Eltingshausen, and Armin Olschewski, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,488

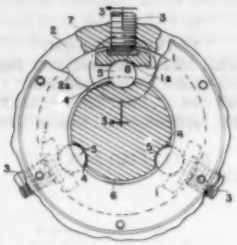
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 8124025[U]

Int. Cl.³ F16C *29/04*

U.S. Cl. 464—167 **2 Claims**

1. In a torque transmitting assembly comprising a housing, an axially slidable shaft mounted for relative longitudinal movement in said housing, an annular space between said shaft and said housing, a plurality of rows of rolling elements in said annular space, said shaft having axially extending grooves defining elongated inner raceways in which are seated the rolling elements, a bearing race plate having an elongated raceway groove mounted between each row of rolling elements and said housing, means for radially adjusting the bearing race plate to align the raceways and fixing it in an axial and peripheral direction relative to said housing to achieve torque transmission between said shaft and said housing, said means comprising a housing screw adjustable radially in said housing and having a terminal end portion confronting and engageable

with a layer of plastically deformable material on the bearing race plate confronting said housing screw, said deformable material conforming to the terminal end of said screw which has a cupped point.

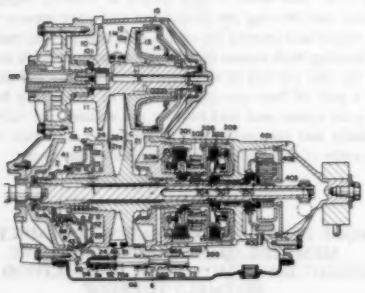


4,482,339

REDUCTION RATIO DETECTING MECHANISM FOR V-BELT TYPE CONTINUOUSLY VARIABLE TRANSMISSION

Nobuaki Miki, Kariya; Norio Sobue, and Shoji Yokoyama, both of Anjo, all of Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Aug. 26, 1981, Ser. No. 296,447
Claims priority, application Japan, Sep. 4, 1980, 55-123033
Int. Cl.³ F16H 55/52
U.S. Cl. 474—28 2 Claims



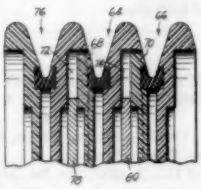
1. In a continuously variable automatic transmission for vehicles having a V-belt continously bariable transmission including an input pulley, an output pulley, each of said pulleys having a fixed flange and a movable flange and adapted to be varied in effective diameter, and a transmission V-belt extended between said input and output pulleys, and an oil hydraulic control device for controlling said V-belt type continuously variable transmission, the improvement comprising a reduction ratio detecting mechanism having a reduction ratio valve with a spool disposed with one end of said spool projecting from a valve body containing said oil hydraulic control device of said V-bept type continuously variable transmission, a connecting lever situated between said movable flange and said reduction ratio valve, said connecting lever engaged at one end to said movable flange, said movable flange capable of rotating the other end of said connecting lever engaged at the projecting end of said spool, the projecting part of said spool connecting to said connecting lever by a cylindrical member and retained to each other by a retaining member attached to the projecting part of said spool, a spring positioned between said spool and said connecting lever, at least one spacer positioned between said retaining member and said connecting lever, making adjustable the relative positions of said movable flange and said spool.

4,482,340

LOW-FRICTION THIN-HUB PLASTIC MULTI-PART SHEAVE

Joseph J. Kovaleski, Easton, Conn., assignor to Wyrepak Industries, Inc., Bridgeport, Conn.

Filed Sep. 28, 1982, Ser. No. 425,482
Int. Cl.³ F16H 55/36
U.S. Cl. 474—180 13 Claims



1. A low-friction thin-hub plastic multi-part sheave for handling wire, comprising in combination:

(a) a pair of disc-like members having apertured, central hub portions with oppositely disposed annular end faces, and having peripheral rim portions,

(b) said peripheral rim portions being adapted to form a V-groove in which the wire, which is to be handled, is received,

(c) said central hub portions having opposed, inwardly facing annular shoulder surfaces,

(d) an anti-friction bearing having inner and outer race members and roller elements engaged with said race members,

(e) the outer race member of the bearing having oppositely facing, parallel exposed annular side surfaces and having an outer periphery and oppositely-acting outwardly facing annular shoulder surfaces on its outer periphery which are separate from said parallel exposed side surfaces,

(f) the opposed, inwardly facing surfaces of the hub portions engaging the oppositely-acting annular shoulder surfaces of the outer race member to hold the bearing captive in said hub portions,

(g) the parallel exposed annular side surfaces of the outer race member of the bearing being substantially completely flush with the respective opposite end faces of the said hub portions, whereby a series of similar hub-bearing assemblages can be disposed in close side-by-side relation, without encountering interference from one another,

(h) fasteners disposed radially outwardly of the hub portions of the disc-like members, for holding the members together, said fasteners effecting an inward bowing of the disc-like members and forcing the opposed, inwardly facing annular shoulder surfaces of the hub portions into firm engagement with the outwardly facing annular shoulder surfaces on the outer race member of the bearing,

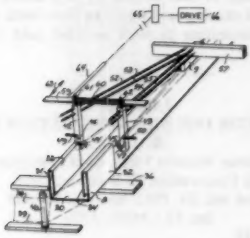
(i) the outer race member of the bearing maintaining an annular space between the disc-like members in the vicinity of the hub portions thereof such that looseness or play between the hub portions and outer race of the bearing is eliminated.

4,482,341

MECHANISM FOR CONVERTING A CROSS-SECTIONALLY SUBSTANTIALLY U-SHAPED WEB OF WRAPPING MATERIAL INTO A WRAPPING TUBE

Hans Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark

Filed Mar. 10, 1982, Ser. No. 356,916
Claims priority, application Denmark, Mar. 18, 1981, 1233/81
Int. Cl.³ B65B 9/08
U.S. Cl. 493—302 6 Claims



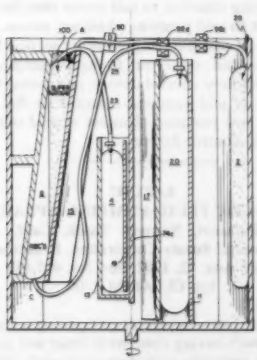
1. A mechanism for converting a cross-sectionally substantially U-shaped web of wrapping material into a wrapping tube by welding together the longitudinal edges of the web by moving the latter against one another and through a welding device, characterized by an edge guiding mechanism arranged ahead of the welding device and comprising means for engagement with the longitudinal edges of the web of wrapping material, guiding means for the engaging means arranged in convergent relationship as viewed in the travelling direction of the web and means for moving the engaging means along the guiding means.

4,482,342

BLOOD PROCESSING SYSTEM FOR CELL WASHING

Richard M. Lueptow, Allston, and Jeffrey J. Peterson, Wellesley, both of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Filed Jun. 17, 1982, Ser. No. 389,242
Int. Cl.³ B04B 5/02
U.S. Cl. 494—21 31 Claims



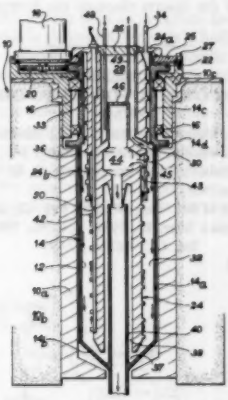
1. Blood pressure apparatus for seperation of blood components by centrifugation in a centrifuge rotor comprising: a first flexible bag and support means for orienting said first flexible bag with respect to the center of rotation of said rotor to cause, upon rotation of said rotor, lighter density components to accumulate at a first location within said bag and heavier components to accumulate at a second location diagonally opposite said first location and wherein ports are located at said first and second locations; an input port located at the second location and wherein said support means has a vertically extending wall with a curved surface tilted inwardly toward and eccentric to the axis of the center of rotation.

4,482,343

APPARATUS FOR DISSOLVING A POWDER IN A LIQUID SOLVENT

Pierre Auchapt, Bagnols, and Aimé Ferlay, Laudun, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 10, 1983, Ser. No. 465,612
Claims priority, application France, Feb. 10, 1982, 82 02168
Int. Cl.³ B04B 11/00
U.S. Cl. 494—56 10 Claims



1. An apparatus for dissolving a powder in a liquid solvent, wherein it comprises a vertically axed rotary bowl, means for introducing the powder and the liquid solvent into the bowl, and a fixed cylindrical member arranged coaxially within the bowl and having on its outer face at least one first helicoidal ramp oriented with respect to the bowl rotation direction in such a way that it ensures the raising of the solution up to means ensuring the removal thereof from the bowl.

4,482,344

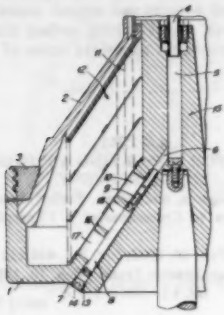
CENTRIFUGE DRUM FOR CLARIFYING AND SEPARATING LIQUIDS

Karl-Heinz Zettler, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,014
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305215
Int. Cl.³ B04B 1/08
U.S. Cl. 494—70 5 Claims

1. In a centrifuge drum for clarifying and separating liquids and having a bottom, a cover, a closure ring that unites the bottom and cover, a stationary inlet pipe that extends into the inlet chamber of a distributor in the drum, bores extending from the inlet chamber, an insert disposed in each bore and comprising a choking device that has an outlet channel, the outlet channels emptying into a vestibule that communicates with rising channels of a disk stack inserted in the drum, the

improvement wherein the bores containing the inserts extend down to the surface demarcating the bottom of the drum and



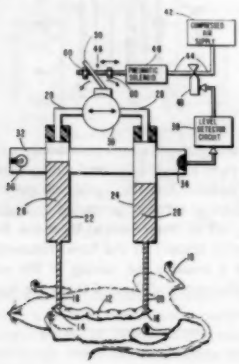
are receptive of the inserts through the bottom of the each bore.

4,482,345

AUTOMATED CONTROL FOR A TWO-DIRECTIONAL PUMP

Wing-Sun Chow, Upper Montclair, N.J.; Richard W. Walton, Middletown Township, Delaware County, Pa., and Donna A. D'Stefan, Plainsboro, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 349,300, Feb. 16, 1982,. This application Mar. 16, 1982, Ser. No. 590,236
Int. Cl.[3] A61M *37/00*
U.S. Cl. 604—31 7 Claims



1. In a system comprising a two-directional air pump having a reversible input and output connected to a pair of vertical columns adapted to hold liquid and to be attached to one another through a communicating passage at their lower ends whereby a closed loop will be formed by said vertical columns, said pump, and said communicating passage, a valve having lever handle means for reversing the input and output of said pump to direct air from said pump into alternating ones of said vertical columns whereby liquid within said vertical column into which air is being pumped will decline while liquid in the other vertical column rises when said columns are attached to one another through a communicating passage, the improvement comprising an automatic control for said system comprising:

(a) level sensing means for sensing the liquid level in either of said verticle columns rising above a predetermined level;

(b) a supply of compressed air;

(c) an electro-pneumatic solenoid means connected to said supply of air for controlling the flow of air from said supply;

(d) a circuit means connected to said level sensing means for alternately opening and closing said electro-pneumatic solenoid each time said level sensing means senses a predetermined liquid level in either of said columns;

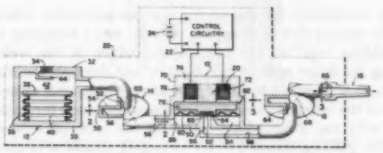
(e) a pneumatic cylinder having a piston with a piston rod connected to said lever handle, said cylinder being connected in such a way that said piston is responsive to said flow of air from said supply, whereby said lever handle is alternately switched in position in response to the liquid level in either of said columns rising above a predetermined level causing said liquid to flow back and forth in said communicating passage between said vertical columns.

4,482,346

APPARATUS FOR INFUSING MEDICATION INTO THE BODY

Robert H. Reinicke, Mission Viejo, Calif., assignor to Consolidated Controls Corporation, El Segundo, Calif.

Filed Jul. 30, 1982, Ser. No. 404,345
Int. Cl.[3] A61M *5/00*
U.S. Cl. 604—152 36 Claims



1. In a system for infusing medication into the body, the combination of, a reservoir of medication, a pumping chamber, a medication outlet, a first flow control device connected between said reservoir and said pumping chamber which permits liquid to flow in both directions between said pumping chamber and said reservoir but offers substantially less resistance to liquid flow from said reservoir to said pumping chamber than for liquid flow from said pumping chamber to said reservoir, a second flow control device connected between said pumping chamber and said outlet which permits liquid to flow in both directions between said pumping chamber and said outlet but offers substantially less resistance to liquid flow from said pumping chamber to said outlet than for liquid flow from said outlet to said pumping chamber, means for increasing the volume of said pumping chamber so that liquid flows primarily from said reservoir to said pumping chamber through said first flow control device, and means for decreasing the volume of said pumping chamber so that fluid flows primarily from said pumping chamber to said outlet through said second flow control device.

4,482,347

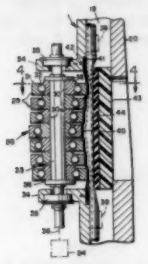
PERISTALTIC FLUID-PUMPING APPARATUS

Alexander S. Borsanyi, Newport Beach, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 12, 1982, Ser. No. 407,439
Int. Cl.[3] A61M *5/00*
U.S. Cl. 604—153 35 Claims

1. A peristaltic pump apparatus comprising a series of bearing assemblies each having concentric inner and outer bearing members freely rotatable with respect to each other; a drive shaft; said inner members of said bearing assemblies being eccentrically mounted upon said drive shaft with the centers of said inner members being equidistant from the axis of said drive shaft and spaced uniform angular distances thereabout to describe a helix about said axis; journal means rotatably supporting said drive shaft; power means for rotating said drive shaft; an elastomeric membrane alongside said series of bearing as-

semblies; means supporting said membrane for tangential engagement with said outer members along a first band of contact on one side of said membrane; a straight, elongated elastomeric tube extending along and engaging the opposite side of said membrane along a second band of contact directly opposite from said first band of contact; and platen means for



supporting said tube with the longitudinal axis thereof in spaced parallel relation with respect to the rotational axis of said drive shaft and in engagement with said membrane along said second band of contact; that portion of said first band of contact associated with each outer member oscillating from side to side in relation to said longitudinal axis of said tube when said apparatus is in operation.

4,482,348

FITMENTS FOR INJECTION DEVICES

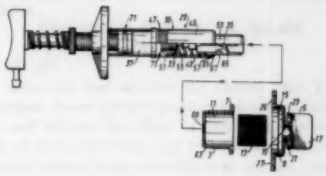
Hugh R. Dent, Chippenham, England, assignor to Sterimatic Holdings Limited, Tortola, British Virgin Isls.

Filed Jan. 13, 1983, Ser. No. 457,686

Claims priority, application United Kingdom, Jan. 14, 1982, 8201048

Int. Cl.[3] **A61M** *5/00*

U.S. Cl. 604—198 **23 Claims**



1. An accessory for use with an injection device of the kind in which injectate is delivered through a hollow needle, the accessory being provided to sterilise the needle of the injection device as the needle is moved therethrough and comprising an enclosure having an end wall which incorporates an integral removable portion attached to the remainder of the end wall by a substantially annular weakened region which is capable of being ruptured in order to separate the removable portion so as to form an aperture in the end wall through which the point of the needle of the injection device may pass, the enclosure incorporating means for sterilising the needle as it is moved therethrough.

4,482,349

SUBSTITUTED-BUTANEDIPEROXOIC ACIDS AND PROCESS FOR BLEACHING

James M. Mayer, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 336,542, Jan. 4, 1982,. This application May 2, 1983, Ser. No. 490,591

Int. Cl.³ D06L *3/02;* C01B *15/10;* D06L *3/04*

U.S. Cl. 8—111 7 Claims

1. A process for bleaching articles comprising contacting articles to be bleached with an aqueous medium containing a bleach effective amount of a compound represented by the formula:

wherein R is alkyl of 6 to 18 carbon atoms of phenyl, and mixtures thereof.

4,482,350

REACTIVE DYE COMPOSITION FOR CELLULOSE FIBER

Takemi Tokieda, Nara, and Sadaharu Abeta, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

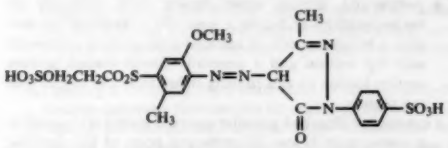
Filed Feb. 14, 1983, Ser. No. 466,303

Claims priority, application Japan, Feb. 19, 1982, 57-26509

Int. Cl.³ C09B *67/24;* D06P *1/38*

U.S. Cl. 8—524 7 Claims

1. A reactive dye composition comprising a combination of 20 to 99% by weight of a dye represented by a free acid of the formula,



and 1 to 80% by weight of an alkylnaphthalenesulfonic acid/formaldehyde condensate having a sulfonation degree of 50 to 150% and an average condensation degree of 1.1 to 3.0.

4,482,351

PROCESS FOR REMOVING ASH FROM COAL

Kohji Kitazawa, Hyogo, and Toshio Ozaki, Osaka, both of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

PCT No. PCT/JP82/00120, § 371 Date Dec. 27, 1982, § 102(e) Date Dec. 27, 1982, PCT Pub. No. WO83/03619, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 14, 1982, Ser. No. 459,691

Int. Cl.³ C10L *5/00, 9/00*

U.S. Cl. 44—1 R 5 Claims

1. A process for physically removing particulate inorganic impurities from pulverized coal by subjecting the pulverized coal to electrostatic separation based on the difference in specific resistance between said particulate inorganic impurities and the coal particles, characterized in that

(a) the pulverized coal is entrained on a stream of non-oxidizing gas for transport and passed through a dry-type electric precipitator to selectively capture the particulate inorganic impurities in said precipitator,

(b) the coal laden gas is subjected to temperature and humidity adjustment in separate steps prior to the introduction of the gas into said precipitator, said temperature adjustment being effected to enhance said difference in specific resistance, said humidity adjustment being effected to enable a high voltage operation of said precipitator, and

(c) highly purified coal is obtained at the outlet of said precipitator as entrained on the gas stream.

4,482,352

FUEL ADDITIVE

Gordon L. Osgood, Romeo, and George G. Reinhard, Warren, both of Mich., assignors to Fuel-X-Tender Corporation, Romeo, Mich.

Filed Mar. 5, 1984, Ser. No. 586,408

Int. Cl.³ C10L *1/30*

U.S. Cl. 44—53 17 Claims

1. A nonacidic fuel additive for carrier fuels to increase power output, lower ignition point of the carrier fuel, increase mileage and reduce the effect of cold temperatures on the viscosity of the carrier fuel, said fuel additive comprising:

(a) methyl ethyl ketone peroxide in an amount ranging from approximately 10 percent to approximately 45 percent by volume of fuel additive;

(b) methyl ethyl ketone in an amount of approximately 15 percent to approximately 50 percent by volume of fuel additive;

(c) thallium in an amount of approximately 30 percent by volume of the fuel additive;

(d) methyl alcohol in an amount of approximately 2 percent by volume of the fuel additive; and

(e) borontrifloride in an amount of approximately 8 percent by volume of the fuel additive.

4,482,353

COMPRESSION IGNITION FUEL COMPOSITIONS

J. Vincent Hanlon, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 4, 1983, Ser. No. 520,156

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—57 20 Claims

1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (a) organic nitrate ignition accelerator, (b) copolymer of an alpha-olefin having from 8 to 30 carbons and an N-substituted maleimide wherein the N-substituents are organic radicals having from 3 to 60 carbons and from 1 to 5 amine nitrogens, said copolymer having from 4 to 20 repeating olefin-maleimide units, and (c) hydrocarbyl amine having from 3 to 60 carbons and from 1 to 10 nitrogens, said combination being present in an amount sufficient to minimize coking on the nozzles of indirect injection compression ignition engines operated on such fuel.

4,482,354

MIDDLE DISTILLATE HYDROCARBON COMPOSITIONS CONTAINING THERMAL STABILITY ADDITIVE

Rodney L. Sung, Fishkill; William M. Sweeney, Wappingers Falls, both of N.Y., and Wheeler C. Crawford, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,129

The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.

Int. Cl.³ C10L *1/08*

U.S. Cl. 44—57 12 Claims

1. A middle distillate composition comprising

(a) a major portion of a petroleum derived middle distillate containing a hydrocarbon boiling in the middle distillate boiling range;

(b) an extending portion of a shale oil diesel fraction; and

(c) a minor effective amount of, as thermal stability additive, an (alkyl polyoxyalkyl) amino alkanoic acid.

4,482,355

DIESEL FUEL COMPOSITIONS

J. Vincent Hanlon, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 30, 1983, Ser. No. 567,071
Int. Cl.[3] C10L 1/22
U.S. Cl. 44—57 12 Claims

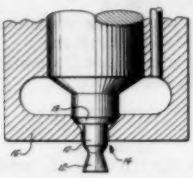
1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (a) organic nitrate ignition accelerator, (b) hydrocarbyl amine having from 3 to 60 carbons and from 1 to 10 nitrogens and (c) N,N'-disalicylidene-1,2-diaminopropane, said combination being present in an amount sufficient to minimize coking on the nozzles of indirect injection compression ignition engines operated on such fuel.

4,482,356

DIESEL FUEL CONTAINING ALKENYL SUCCINIMIDE

J. Vincent Hanlon, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 30, 1983, Ser. No. 567,089
Int. Cl.[3] C10L 1/22
U.S. Cl. 44—57 49 Claims



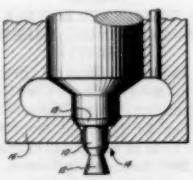
1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (a) organic nitrate ignition accelerator and (b) hydrocarbyl-substituted succinimide or succinamide, said combination being present in an amount sufficient to minimize coking in the nozzles of indirect injection compression ignition engines operated on such fuel.

4,482,357

FUEL COMPOSITIONS

J. Vincent Hanlon, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 30, 1983, Ser. No. 567,090
Int. Cl.[3] C10L 1/22
U.S. Cl. 44—63 28 Claims



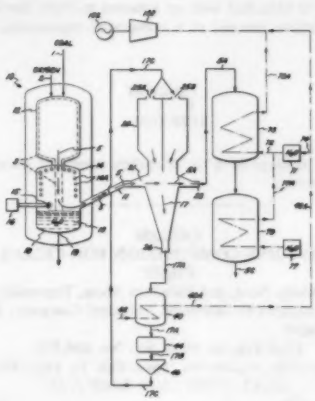
1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (a) hydrocarbyl-substituted succinimide or succinamide, (b) hydrocarbyl amine having from 3 to 60 carbons and from 1 to 10 nitrogens and (c) N,N'-disalicylidene-1,2-diaminopropane, said combination being present in an amount sufficient to minimize coking on the nozzles of indirect injection compression ignition engines operated on such fuel.

4,482,358

GRANULAR BED FILTERING DEVICE

Benjamin C. B. Hsieh, and Archie H. Perugi, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 17, 1983, Ser. No. 476,099
Int. Cl.[3] C10J 3/68
U.S. Cl. 48—77 3 Claims



1. Apparatus for removing slagging ash suspended in the hot gases exiting an entrained bed coal gasifier, said apparatus comprising, in combination:

a pressurized, upright vessel having three vertically arranged sections including a generally cylindrical top section, a middle section of reduced cross-section relative to said top section and a generally funnel-shaped bottom section having its axis radially offset from the axis of said top section;

a quantity of filter bed granular material within said vessel of a temperature below the softening point of the slagging ash;

an entry in said top section for introducing said granular material into said vessel;

an exit in said bottom section for removing said granular material from said vessel, whereby said granular material flows as a moving filter bed vertically through said vessel from said top section to said bottom section through said middle section;

an inlet for introducing pressurized hot gases from the entrained bed coal gasifier into said vessel for flow transversely through said moving filter bed of granular material, said inlet being located in said middle section immediately above its junction with said bottom section such as to present an opening into said vessel inclined at an angle generally corresponding to the natural angle of repose of said granular material moving through said middle section, whereby said granular material fully confronts the gases immediately upon entry into said vessel and is precluded from flowing out said inlet without resort to permanent obstructions; and

an outlet for removing hot gases from said vessel and located in transversely opposed relation to said inlet, said outlet including a screen disposed across its junction into said vessel for retaining said granular material in said vessel;

whereby slagging ash suspended in said hot gases agglomerates on the granules of said material as said gases pass therethrough from said inlet to said outlet, said slagging ash removal being carried out at substantial the pressure of the hot gases.

4,482,359
FLUIZIDED BED METHOD AND APPARATUS FOR PRODUCING A COMBUSTIBLE GAS

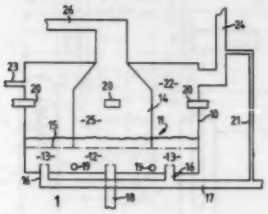
Peter B. Caplin, Sunbury on Thames, England, assignor to The Energy Equipment Company Limited, Bedforshire, England

Filed Jul. 20, 1982, Ser. No. 400,089

Claims priority, application United Kingdom, Jul. 28, 1981, 8123161; Aug. 19, 1981, 8125373

Int. Cl.³ C10J *3/54, 3/56, 3/86*

U.S. Cl. 48—89 **10 Claims**



1. A method of making combustible gas in which a single homogeneous bed of finely divided inert particulate material has gasses passed thereto to fluidise the bed material and in which fuel is fed to the bed for combustion, comprising;

(a) passing a first gas to one or more first sections of the bed via a first array of sparge tubes extending generally horizontally through the bed to fluidise the bed material therein and support an endothermic combustion of said fuel fed thereto to produce a combustible gas;

(b) passing a second gas to one or more second sections of the bed via a second array of sparge tubes extending generally horizontally through the bed material to fluidise the bed material therein and support an exothermic combustion of said fuel fed thereto to produce heat and flue gases;

(c) passing a third gas via a third array of sparge tubes extending generally horizontally through the bed material to fluidise the bed material at boundaries between the first section or sections and the second section or sections to prevent movement of gases across said boundaries;

(d) transferring the heat produced in step (b) to the first section or sections of step (a) to support the endothermic combustion thereof by migration of bed material and combusting fuel across said boundaries;

(e) maintaining the combustible gas evolving in step (a) separate from the flue gases evolving from step (b) via one or more gas impermeable walls, wherein said walls extend partially into the bed when the bed is fluidized but do not extend into the bed for any substantial distance and do not provide a physical barrier for the movement of gases or material between the bed sections.

4,482,360
POROUS MATERIALS FOR CONCENTRATION AND SEPARATION OF HYDROGEN OR HELIUM, AND PROCESS THEREWITH FOR THE SEPARATION OF THE GAS

Eiiji Taketomo, and Masami Fujiura, both of Fukuoka, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 25, 1983, Ser. No. 498,174

Claims priority, application Japan, May 29, 1982, 57-90500; Jul. 2, 1982, 57-113988

Int. Cl.³ B01D *53/22*

U.S. Cl. 55—16 **17 Claims**

1. Porous materials for use for separation of a gas having a molecular weight not larger than 4 in a high concentration from a mixture gas containing such gas, comprising not less than 50% of pores having a diameter ranging from 110 to 160 Å with respect to the total pore volume, said pore diamter being determined by nitrogen adsorption measurement.

7. A process for separating a concentrated gas having a molecular weight not larger than 4 from a gaseous mixture containing such gas, using a separation and concentration apparatus having therein two spaces with a porous material wall arranged therebetween, which comprises supplying the

gaseous mixture into the first of the two spaces and passing the gaseous mixture through said porous material wall to separate the concentrate gas into the second space, wherein not less than 50% of the pores in said porous material have a diameter ranging from 110 to 160 Å with respect to the total pore volume, said pore diameter being determined by nitrogen adsorption measurement.

4,482,361
PRESSURE SWING ADSORPTION PROCESS

Michael Whysall, Wilrijk, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 14, 1983, Ser. No. 457,915

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **15 Claims**

1. In a pressure swing adsorption process for the selective adsorption of at least one component of a feed gas mixture in an adsorption system having at least four adsorbent beds, each of which undergoes, on a cyclic basis, (1) higher pressure adsorption, (2) cocurrent depressurization from said higher pressure to upper intermediate pressure(s) with release of void space gas from the product end of the bed, said gas being passed directly to another bed(s) in the system and initially at a lower pressure than said upper intermediate pressure(s) for pressure equalization therebetween (3) further cocurrent depressurization from said upper intermediate pressure reached at the completion of step (2) above to a lower intermediate pressure with release of additional void space gas from the product end of the bed, said gas being passed directly to another bed in the system at its lower desorption pressure to provide purge gas directly to said other bed to be purged, (4) purge, in which void space gas released from another bed is passed directly thereto, with or without prior countercurrent depressurization to a lower desorption pressure, (5)partial repressurization to said upper intermediate pressure(s) by the addition of void space gas thereto, said gas being passed to the bed from another bed(s) in the system and initially at a higher pressure than said upper intermediate pressure(s) for pressure equalization therebetween and (6) final repressurization to said higher adsorption pressure from the upper intermediate pressure reached upon completion of said pressure equalization, the improvement consisting essentially of:

(a) passing a portion of the void space gas released from the product end of the adsorbent bed during step (3) above to an empty external vessel for the repressurization thereof simultaneously with the passage of another portion of said void space gas directly to another adsorbent bed in the system to be purged during step (3) above: and

(b) passing void space gas from the thus-repressurized external vessel to the same adsorbent bed into which void space gas was passed directly during step (3) above, with said passage of gas from the external vessel to said bed occurring immediately after said bed completes said purge step using purge gas provided directly in step (3) above, thus partially repressurizing said purged bed, to a pressure greater than its lower desorption pressure prior to further partial repressurization in step (5) above to upper interme-

diate pressures by pressure equalization with another bed or beds in the adsorption and subsequent final repressurization to said higher adsorption pressure in step (6) above, whereby the product recovery and/or purity obtained in the system are enhanced.

4,482,362

METHOD FOR PRODUCING PURIFIED GASES

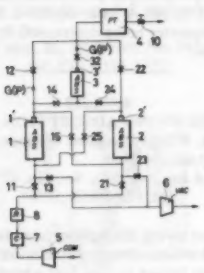
Norio Yamazaki, Itami; Naoyoshi Takaoka, Tondabayashi; Mikio Shinoki, Matsubara, and Ryonosuke Huruichi, Toyonaka, all of Japan, assignors to Taiyo Sanso Co., Ltd., Osaka, Japan

Filed Jan. 20, 1983, Ser. No. 459,564

Claims priority, application Japan, Jan. 26, 1982, 57-11084

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—62 **4 Claims**



1. A process for purifying a gas, comprising the use of a main adsorber and a supplementary adsorber in which the supplementary adsorber contains less adsorbent therein than said main adsorber, said process comprising the steps of:

introducing a feed gas into the main adsorber and discharging a product gas out of an outlet of the main adsorber;

connecting the main adsorber in series with the supplementary adsorber when purity of the product gas substantially reaches a predetermined critical value P; and,

removing the product gas from an outlet of the supplementary adsorber until the product gas substantially reaches a predetermined critical value.

3. A process for purifying a gas including a regular cycle of adsorption and regeneration using at least two main adsorbers and at least one supplementary adsorber having less adsorbent therein than the main adsorbers, said process comprising the steps of:

carrying out an adsorption process at a regenerated one of said main adsorbers with feed gas G_0 introduced thereinto and simultaneously and in parallel carrying out a regeneration process at the other of said main adsorbers and said supplementary adsorber;

connecting said supplementary adsorber in series with said one main adsorber to continually take out a product gas from an outlet of the supplementary adsorber said regeneration process at said other adsorber being continued, when product gas discharged from the outlet of said one main adsorber reaches or nears a predetermined critical purity;

completing the adsorption process when the product gas discharged from the outlet of said supplementary adsorber reaches or nears a predetermined critical purity; and

switching said one main adsorber and said supplementary adsorber to the regeneration process and switching said other main adsorber to an adsorption process after pressure-equalization.

4,482,363

PROCESS FOR THE COOLING AND SEPARATING OF SMALL PARTICLE-CONTAINING GASES

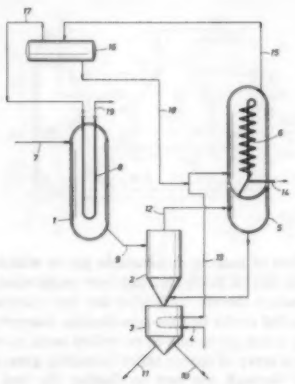
Bernardus H. Mink, Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1982, Ser. No. 436,900

Claims priority, application United Kingdom, Feb. 15, 1982, 8204325

Int. Cl.³ B01D *37/00*

U.S. Cl. 55—69 **6 Claims**



1. A process for the cooling of small particle-containing gases originating from a coal gasification reactor, and for separation of small particles from said gases, said gases comprising fine, very fine, and coarser particles, having a temperature in the range of from 800°–1400° C. and a pressure in the range of from 3–60 bar, comprising cooling the gases in a heat exchanger by passing the gases in indirect heat exchange with steam so as to produce superheated steam, then passing the gases into a cyclone and separating said coarser particles from the gases, and thereafter cooling said gases further by passing them into and through at least one helically coiled tube which is cooled with a cooling medium.

4,482,364

OIL GAS/SEPARATOR

Reginald Martin, deceased, late of Luton, England; by Winifred White, legal representative, 277 City Rd., Sheffield, England; by Nora Edwards, legal representative, 1 Southfield Way Much, Wenlock, England; John W. Brookes, 3, Gables Close, Chalfont St. Peter, Buckinghamshire, England, and Thomas S. Reeve, 72, Halfway Ave., Luton, Bedfordshire, England

Filed May 6, 1983, Ser. No. 492,231

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—158 **14 Claims**

1. In a separator device for separating gas from oil in a mixture thereof at high pressure, such as at the well head of an oil well,

the improvement comprising:

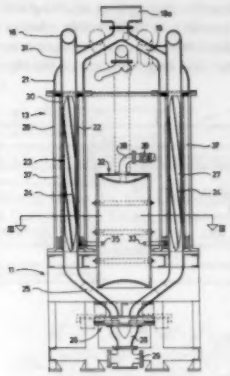
means for causing the mixture to follow a generally helical flow path,

means defining in part said generally helical flow path including a radially outer gas-permeable wall, said gas-permeable wall constituting part of a generally cylindrical sleeve, said generally helical flow, path being defined in part by said sleeve,

means for generating a pressure differential across said gas permeable wall such that said gas in said mixture is urged to traverse said gas-permeable wall,

a gas collection gallery located radially outwardly of said

gas-permeable wall for collection of said gas traversing said wall, and



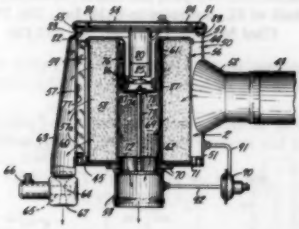
guide means for directing oil retained by said gas-permeable wall to an oil delivery duct.

4,482,365

VORTEX AIR CLEANER AND SELF-CLEANING BARRIER FILTER ASSEMBLY FOR SUPERCHARGED ENGINES

Charles J. Roach, Brooklyn, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,705
Int. Cl.³ B01D *46/04, 46/48, 50/00*
U.S. Cl. 55—218 **15 Claims**



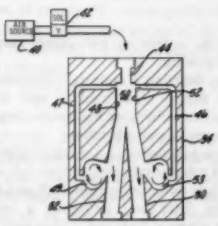
9. A self-cleaning barrier filter assembly for use in pressurized fluid systems from which a filter-unloading flow can be dumped, comprising, in combination, a filter housing having an upstream inlet for unfiltered fluid, a downstream outlet for filtered fluid and an upstream outlet for filter-unloading dump flow; and disposed across the line of flow between the unfiltered upstream fluid inlet and downstream filtered fluid outlet a rotatable barrier filter cartridge, the barrier filter cartridge being made of material capable of withstanding an elevated operating temperature within the range from at least about 250° F. to about 600° F., and being mounted in the assembly for rotation; means in the housing for rotating the barrier filter cartridge at a speed within the range from about 0.05 to 5 revolutions per minute; and means in the housing upstream of the barrier filter cartridge in communication with an upstream surface of the barrier filter cartridge and defining, and restricting fluid flow into, a zone of differential fluid pressure in close proximity to a portion of the upstream barrier filter cartridge surface for generating at the upstream barrier filter cartridge surface within the zone an outward backflow of pressurized fluid through the barrier filter cartridge from downstream thereof entraining material collected on the upstream surface of the barrier filter cartridge and dumping such material via the means and the upstream dump flow outlet during rotation of the barrier filter cartridge and thus inhibit pressure drop across the barrier filter cartridge from exceeding a selected maximum; the upstream dump flow outlet including a solenoid valve opening and closing the outlet and a differential pressure switch in operative actuating relation to the solenoid valve, sensing differential pressure across the barrier filter cartridge and actuating the valve to open the outlet whenever such differential pressure reaches a predetermined value.

4,482,366

PULSE-TYPE CLEANING MEANS FOR FILTER PANELS

Harry R. Camplin, Marine, and Patrick Golden, Minneapolis, both of Minn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 29, 1983, Ser. No. 508,783
Int. Cl.³ B01D *46/04;* **F15C** *1/08*
U.S. Cl. 55—273 **6 Claims**



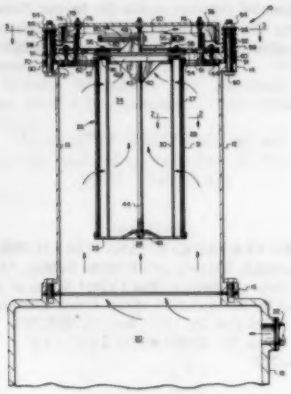
1. An engine air cleaner comprising first and second air filter panels having particulate trapping media therein; means for periodically removing particulates from said media trapped in each panel; said removing means comprising a first air blast nozzle structure arranged to move along the downstream face of the first panel, and a second air blast nozzle structure arranged to move along the downstream face of the second panel; an air pressure source; and a fluidic oscillator interposed between the air pressure source and particulate removing means; said fluidic oscillator comprising an air input channel connected to the pressure source, a first output channel connected to the first air blast nozzle structure, and a second output channel connected to the second air blast nozzle structure; the instantaneous output of the oscillator being through either the first output channel or the second output channel but not simultaneously through both output channels, whereby each nozzle structure is supplied with pulses of air on a time-staggered basis; each filter panel comprising a porous fabric sheet formed into a series of V-shaped pleats; each nozzle structure being arranged for movement transversely across the V-shaped pleats whereby the nozzle structure discharges its blast of air into successive ones of the V spaces as the nozzle structure moves along the filter panel face; the V-shaped pleats in each filter panel having substantial amplitude dimensions normal to the nominal plane of the panel, whereby the porous fabric sheet material has substantial flexibility; the movement rate of each nozzle structure being related to the pleat width and pulse frequency whereby the porous fabric material in each V-shaped pleat undergoes at least one rapid oscillating flexural motion due to air blast pulsations generated by the associated nozzle structure.

4,482,367

SELF-CLEANING AIR FILTER SYSTEM

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Filed Jul. 15, 1982, Ser. No. 398,684
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—304 **20 Claims**



1. Apparatus for separating particulate material from an air flowstream comprising:

a first housing defining a material separation chamber;

inlet conduit means connected to said first housing and opening into said chamber for conducting a material laden air flowstream to said chamber;

a second housing including a generally cylindrical elongated open ended tubular member supported on said first housing and in flow communication with said first housing; and

a self-cleaning filter unit including a cylindrical porous media filter element disposed within said tubular member, support means for said filter element including a resilient membrane positioned to provide a closure for one end of said chamber and including clean air flow passage means for conducting clean air from said chamber, said membrane providing the sole supporting connection between said filter element and said second housing, and means for vibrating said filter element, said means for vibrating being mounted on said support means for said filter element and being mechanically isolated from said second housing by said membrane.

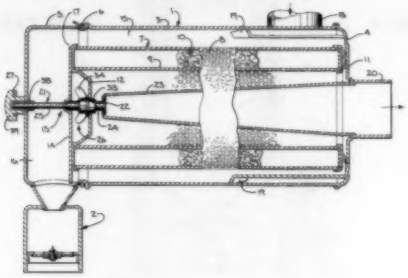
4,482,368

AIR CLEANING ASSEMBLY INCLUDING A FASTENING ASSEMBLY HAVING A NOVEL WING NUT CONSTRUCTION

Mark T. Roberts, Oregon, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed Feb. 28, 1983, Ser. No. 470,273
Int. Cl.³ B01D *46/24;* **F16B** *39/34, 37/16*
U.S. Cl. 55—480 **11 Claims**

1. An air cleaner assembly, comprising an outer housing having an open end, said housing having an air inlet and an air outlet, a cover positioned and arranged to enclose the open end of the housing, a filter element spaced radially inward of the housing and disposed between said inlet and outlet whereby air will flow from said inlet through said filter element to said outlet, said filter element including a filtration medium and a cap engaging the filter element and spaced axially from said cover, a fastening assembly securing the filter element within the housing and fastening the cover to said housing, said fastening assembly including a bolt having a head and a threaded stem, means for connecting the head to the housing, said stem extending through a first opening in the cap and a second aligned opening in said cover, a wing nut having an outer exposed plastic wing section and a metal inner threaded nut section having an internal thread engaged with the threaded stem, said wing nut bearing against said cap and securing said element to said housing, a deformable plastic ring disposed axially adjacent the thread on said nut section, said ring having an internal diameter less than the crest of the thread on said nut



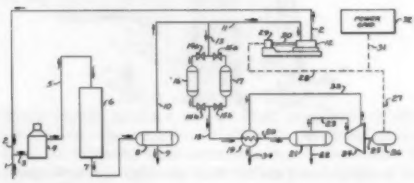
section and being deformed as said wing nut is threaded onto said stem to thereby provide a seal along the threaded connection, a shank formed integrally with said wing section and extending through said first opening in said cap, and an outer knob engaged with the outer end portion of said stem and bearing against the cover for securing the cover to the open end of said housing.

4,482,369

PROCESS FOR PRODUCING A HYDROGEN-RICH GAS STREAM FROM THE EFFLUENT OF A CATALYTIC HYDROCARBON CONVERSION REACTION ZONE

Don B. Carson, Mt. Prospect, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 10, 1983, Ser. No. 493,180
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—18 **10 Claims**



1. A process to provide a purified hydrogen-rich gas stream and to maximize recovery of C_3^+ hydrocarbons from a catalytic hydrocarbon conversion reaction effluent containing hydrogen and hydrocarbons by treating said effluent from a catalytic hydrocarbon conversion reaction zone comprising the steps of:

(a) passing said catalytic hydrocarbon conversion reaction effluent containing hydrogen and hydrocarbons to a first vapor-liquid equilibrium zone, recovering therefrom a hydrogen-containing vapor phase and recycling a first portion thereof to said hydrocarbon conversion reaction zone;

(b) drying at least a second portion of the hydrogen-containing vapor phase by removing water therefrom and thereafter cooling the dried portion by indirect heat exchange with a hereinafter defined hydrogen-rich gas stream;

(c) passing the dried, cooled portion of the hydrogen-containing vapor phase to a second vapor-liquid equilibrium separation zone to produce a liquid stream comprising

C_3+ light hydrocarbons, which are recovered from said process, and a purified hydrogen-rich gas stream;

(d) expanding at least a portion of said purified hydrogen-rich gas stream and thereafter subjecting it to indirect heat exchange with the dried portion of the hydrogen-containing vapor phase pursuant to step (b) above; and,

(e) recovering said heat exchanged purified hydrogen-rich gas stream.

4,482,370

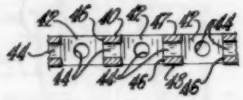
METHOD AND APPARATUS FOR FORMING GLASS FIBERS

Arnold J. Eisenberg, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 15, 1983, Ser. No. 485,357

Int. Cl.³ C03B *37/085*

U.S. Cl. 65—1 **5 Claims**



5. The method of producing glass fibers comprising:

providing a wall having a plurality of orifices extending therethrough adapted to supply streams of molten glass to be attenuated into filaments and having a plurality of spaced-apart passageways enclosed within said wall interconnecting said orifices, said orifices having a sleeve associated therewith extending from one side of said wall to the opposite side of said wall, said passageways being adapted to permit the molten inorganic material to move therethrough, said passageways joining said orifices at said sleeves; and attenuating the streams into filaments.

4,482,371

METHOD AND COMPOSITION FOR SUPPRESSING THE NITRIFICATION OF AMMONIUM NITROGEN IN SOIL

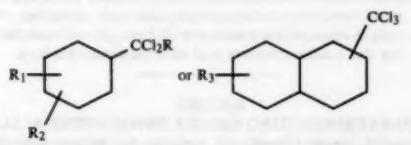
Peter G. Heytler, and Frank D. Marsh, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 14, 1983, Ser. No. 485,004

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—27 **15 Claims**

1. A method of inhibiting the nitrification of ammonium nitrogen in soil comprising treating the soil with an effective amount of one or more compounds of the formulas



wherein

R is Cl or CH_3;

R_1 is H, F, Cl, Br, CN, NO_2, SO_2R_4, CO_2R_5 or methyl substituted with 1-3 atoms of F or Cl;

R_2 is H, Cl, NO_2, CF_3, C_1-C_4 alkyl or C_1-C_4 alkoxy;

R_3 is H, Cl, NO_2 or SO_2CH_3, CH_3, OCH_3; and

R_4 and R_5 are independently C_1-C_3 alkyl provided that when R_2 is other than H and when R_1 and R_2 are bonded to the 2, 6 positions of the benzene ring, then R_1 and R_2 are both Cl.

4,482,372

FLUID FERTILIZER COMPOSITION

Derek A. Palgrave, Doncaster; Frederick A. Waite, Farnham Common; James D. Birchall, Chester, all of England; John Cooper, and James A. Enever, both of Kilmarnock, Scotland, assignors to Imperial Chemical Industries PLC, Hertfordshie, England

Continuation of Ser. No. 227,412, Jan. 22, 1981, abandoned, which is a division of Ser. No. 44,161, May 31, 1979, Pat. No. 4,265,406. This application Dec. 23, 1982, Ser. No. 452,497

Claims priority, application United Kingdom, Mar. 30, 1979, 7911207

Int. Cl.³ C05B *7/00*

U.S. Cl. 71—35 **4 Claims**

1. A stable fluid fertilizer suspension of fine crystalline solids in a saturated solution thereof, the suspension being based essentially on potassium chloride and an ammonium phosphate and being prepared by a process which comprises comminuting to an average particle diameter of less than about 45 microns a solid substance containing potassium chloride and ammonium phosphate, by grinding it in the presence of a saturated solution of the solid substance in a liquid in which the solid has a solubility greater than 1% by weight, the mixture of the solution and the solid being in fluid condition with the solid being a separate phase during grinding and the solution having dissolved therein an additive which is a crystal growth inhibitor for the solid whereby crystal growth is inhibited at both existing crystal surfaces and new crystal surfaces created by the breaking down of relatively coarse particles, the additive being selected from the group consisting of the ferrocyanides and ferricyanides of sodium or potassium, borax, cadmium chloride and lead chloride.

4,482,373

BENZOXAZOLYLOXY PHENOXY ESTERS AND USE AS MONOCOTYLEDONOUS WEED GRASS HERBICIDES

Reinhard Handte; Karl Matterstock, both of Hofheim am Taunus; Hermann Bieringer, Eppstein, and Helmut Köcher, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

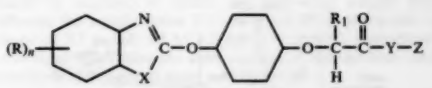
Continuation of Ser. No. 137,953, Apr. 7, 1980, abandoned. This application Sep. 7, 1983, Ser. No. 529,923

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1979, 2914300

Int. Cl.³ A01N *43/76*; C07D *263/58*

U.S. Cl. 71—88 **4 Claims**

1. A compound of the formula



wherein

R is halogen, CF_3, NO_2, CN(C_1-C_4) alkyl or (C_1-C_4) alkoxy;

n is 0, 1 or 2;

X is O;

Y is O or S;

R^1 is H or (C_1-C_4) alkyl;

A is (C_1-C_3) alkylene and

R^4 is H or unsubstituted (C_1-C_{12}) alkyl.

3. Herbicidal composition containing, in addition to the usual additives and formulation auxiliaries, a herbicidally effective amount of a benzoxazole as defined in claim 1.

4,482,374

PRODUCTION OF ELECTRICALLY CONDUCTIVE METAL FLAKE

Donald H. Osborn, Suffern, and Richard J. Basley, Stony Point, both of N.Y., assignors to MPD Technology Corporation, Wyckoff, N.J.

Filed Jun. 7, 1982, Ser. No. 386,051
Int. Cl.³ B22F 9/08
U.S. Cl. 75—0.5 R **25 Claims**

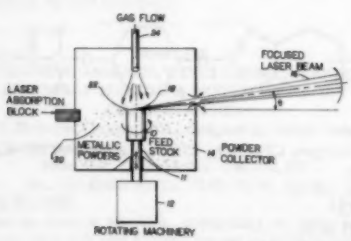
1. A process for producing metal flake having improved conductivity comprising wet ball milling a powder of a conductive metal in a mobile liquid system containing a small amount of lubricant to produce a conductive metal flake, said conductive metal being selected from the group consisting of nickel, copper, cobalt, aluminum, chromium, gold, platinum group metals and conductive alloys thereof, said lubricant comprising an organometallic substituted alcohol, and said organometallic alcohol being at least partially soluble in the mobile liquid system and being decomposable below the sintering temperature of the conductive metal flake.

4,482,375

LASER MELT SPIN ATOMIZED METAL POWDER AND PROCESS

Shankar M. Sastry, Chesterfield; James E. O'Neal, Bridgeton, and Tzy C. Peng, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 5, 1983, Ser. No. 558,204
Int. Cl.³ B22D 23/08
U.S. Cl. 75—0.5 C **11 Claims**



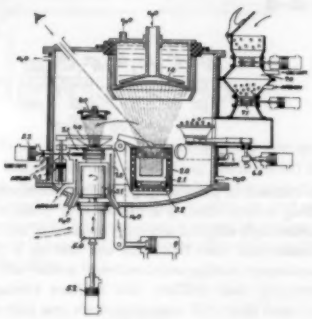
1. A method of melting and rapidly solidifying metals comprising rotating a body of the metal stock, impinging a laser beam on the surface of the rotating stock, the laser beam being disposed transversely across the surface of the rotating body of stock, to melt a thin film of metal from the surface of the rotating body, rotating the body at a speed effective to disperse the melted film from the periphery of the rotating body and atomize it into fine droplets and cooling and solidifying the droplets to form a metal powder.

4,482,376

METHOD OF AND APPARATUS FOR MELTING AND CASTING REACTIVE METALS

Mihail Tărăsescu; Margareta Oproiu; Alexandru Asultanei; Grigore Bucur; Nicu Ceausescu; Constantin Popovici; Mihai Balaceanu, and Mihai Popescu, all of Bucharest, Romania, assignors to Institutul De Cercetare Stiintifica, Inginerie Tehnologica Si Proiectare Pentru Sectoare Calde, Bucharest, Romania

PCT No. PCT/RO81/00006, § 371 Date Jul. 9, 1982, § 102(e) Date Jul. 9, 1982, PCT Pub. No. WO82/01677, PCT Pub. Date May 27, 1982
Continuation of Ser. No. 403,508, Jul. 9, 1982, abandoned. This PCT application Oct. 9, 1981, Ser. No. 555,434
Claims priority, application Romania, Nov. 14, 1980, 102590
Int. Cl.³ C22B 4/00
U.S. Cl. 75—10 R **3 Claims**



1. A method of melting and pouring a highly reactive high-melting metallic material which comprises the steps of:
(a) providing a tiltable crucible in an evacuatable enclosure;
(b) evacuating said enclosure to a pressure of 10^{-1} to 10^{-2} torr;
(c) introducing said material into said enclosure and depositing same in said crucible;
(d) directing a first electron beam source from a high voltage glow discharge, focused upon the material in said crucible by the geometry and relative disposal of the cathode, thereby melting said material;
(e) introducing a mold through a vacuum lock into said enclosure alongside said crucible;
(f) preheating said mold by directing another glow discharge electron beam thereon in said enclosure;
(g) tilting said crucible to pour the molten material from said crucible into the pre-heating said mold; and
(h) removing said mold after said molten material has been poured into it through said lock by initially enclosing the mold containing said material in said lock, equalizing said lock to atmospheric pressure with inert gas and withdrawing the mold containing said material from said lock.

4,482,377

SEPARATION OF ZINC FROM A ZINC-COPPER ALLOY

Sidney M. Heins, Chicago, Ill., assignor to Chempro Corporation, Chicago, Ill.

Filed Apr. 15, 1983, Ser. No. 485,209
Int. Cl.³ C22B 19/20, 15/08
U.S. Cl. 75—101 R **2 Claims**

1. In a process for recovering zinc from a zinc-copper alloy, the step which consists essentially of reacting the alloy in the form of particles passing through a 20-mesh screen with an aqueous alkali metal bisulfate solution in a concentration of at least about 0.22 mole of said bisulfate per 100 grams of solution, at a temperature of about 60° F. to 120° F., for a period of time of about 5 minutes and at a pH of about 1 to 3, to dissolve zinc

from the alloy and leave an undissolved residue containing the copper which was present in the alloy.

4,482,378

COLOR DEVELOPERS AND THERMOGRAPHIC RECORD COMPOSITIONS CONTAINING THEM

Claude R. Riou, Veyrier du Lac, and Jean F. Fayard, Cran-Gevrier, both of France, assignors to Societe Anonyme: Aussedat-Rey, France

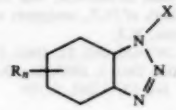
Filed Jun. 15, 1982, Ser. No. 388,690

Claims priority, application France, Jun. 24, 1981, 81 12910

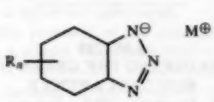
Int. Cl.³ B41M *5/18, 5/22;* C09D *11/00*

U.S. Cl. 106—14.5 **24 Claims**

1. A thermographic composition comprising a color former and a color developer, wherein said color developer comprises a compound of the formula:



wherein R is selected from the group consisting of H, alkyl, NO_2, halogen, aryl, NH_2, OH, COOH, HSO_3, NR_1R_2, $COOR_3$, and OR_4, wherein R_1, R_2, R_3, and R_4 are selected from the group consisting of alkyl and aryl, wherein n is an integer of from 0 to 4, and wherein X is selected from the group consisting of H, a group possessing a labile H capable of forming a stable anion by loss of a proton H^+, and their salts of formula, when X is H:



in which M^+ represents a metal cation.

4,482,379

COLD SET CEMENT COMPOSITION AND METHOD

Benton L. Dibrell, Laurel, Miss., and Richard G. Gandy, Grand Prairie, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Oct. 3, 1983, Ser. No. 538,647

Int. Cl.³ C04B *7/35, 7/353*

U.S. Cl. 106—76 **12 Claims**

1. A cement composition made up of dry solids for use in preparing a pumpable slurry capable of setting and developing compressive strength at low temperatures, comprising:

a hydraulic cement, gypsum, a divalent chloride salt, and a setting time retarding agent; and

an additive blend comprising lime, sodium metasilicate, and hydroxyethyl cellulose.

4,482,380

HARDENER FOR WATER GLASS CEMENTS

Albert Schlegel, Niedernhausen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 13, 1982, Ser. No. 408,029

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133354

Int. Cl.³ C01B *25/26*

U.S. Cl. 106—84 **11 Claims**

2. Hardener for water glass cement which imparts to a water glass cement composition a pot life of from 1 to 2 hours and renders the composition waterproof in 1 day, the hardener comprising thermally-tempered condensed iron/aluminum phosphates having an atomic ratio of Al:Fe of from 95:5 to 5:95 and an atomic ratio of P:(Al+Fe) of from 1.1:1 to 3:1.

8. A process for manufacturing tempered aluminum-containing phosphate by thermal treatment which comprises:

(a) evaporating a solution containing aluminum, iron and phosphate to obtain an acidic phosphate having an atomic ratio Al:Fe of from 95:5 to 5:95 and an atomic ratio P:(Al+Fe) of from 1.1:1 to 3:1,

(b) heating the acidic phosphate to a temperature which is at least about 200° C. and not exceeding 400° C. until its weight remains constant and

(c) heating the product by step (b) to a temperature which is at least 400° C. and not exceeding 750° C. until its weight remains constant.

4,482,381

SOLID POLYAMINE-BASED FLUID LOSS CONTROL ADDITIVES

Rodney D. Spitz, and Donald R. Valk, both of Muskegon, Mich., assignors to Cordova Chemical Company of Michigan, North Muskegon, Mich.

Filed Jun. 21, 1982, Ser. No. 390,598

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **22 Claims**

1. A free flowing solid particulate well cement having reduced fluid loss during well cementing operations comprising:

a composition of a polyamine dispersed on a finely divided, solid adsorbent having surface area of at least 1.0 square meter/gram selected from the group consisting of silica, silicate, and mixtures thereof, wherein about 25 to about 65 percent of the weight of the composition is polyamine; and

a dry hydraulic cement blended with the polyamine composition.

4,482,382

POURING REPAIR MATERIAL FOR MORTAR OR THE LIKE WALL

Hisayasu Kanayama, Tokyo; Yoshiaki Sasaki, Ebina; Naoki Furuno, Yokohama; Yoshitaka Sasaoka, Yokohama, and Osamu Tokita, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1983, Ser. No. 494,933

Claims priority, application Japan, May 19, 1982, 57-82989

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **9 Claims**

1. A fluid pouring repair material for mortar or the like wall which consists of a synthetic resin emulsion, hydraulic cement and aggregate slags with particle size less than 0.5 mm, and water as required to satisfy the following weight ratios wherein the weight ratios P/C, C/S and W/C are within the range of 0.1 to 0.3, 1.5 to 2.5 and 0.35 to 0.40, respectively, wherein P designates the solid content of the synthetic resin emulsion, C cement, S slags and W water.

4,482,383

POLYAMINE FLUID LOSS ADDITIVE FOR OIL WELL CEMENTS

Lee F. McKenzie, Arlington, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 9, 1983, Ser. No. 502,821

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **2 Claims**

1. An aqueous cement composition for cementing the annular space between a pipe and the surrounding bore in a well, having zero free water content and fluid loss characteristics of less than about 85 cc/30 minutes at 140° F., comprising:

a hydraulic cement;

water present in an amount effective to produce a pumpable slurry;

a polyamine fluid loss additive, said polyamine being selected from the group consisting of polyalkylenepolya-

mines, polyalkylenimines and mixtures thereof, and said polyamine being neutralized in pH within the range of 6 to 8; and

a lignosulfonate retarder material selected from the group consisting of calcium, sodium and ammonium lignosulfonate.

4,482,384

CEMENTITIOUS COMPOSITIONS AND METHODS OF MAKING SAME

Charles H. Miller, North Shore, Calif., assignor to Eterna-Tec Corporation, Porter, Ind.

Filed Feb. 28, 1983, Ser. No. 470,244

Int. Cl.³ C04B *7/352, 7/355*

U.S. Cl. 106—92 **17 Claims**

1. A cementitious mixture comprising by weight:

at least 80 parts but not in excess of about 120 parts of Portland cement;

at least about 30 parts but not in excess of 90 parts of refractory cement;

less than about two parts of an alkali metal carbonate;

less than about two parts of a carbohydrate; and,

less than about two parts of a fatty acid ester.

4,482,385

CEMENTITIOUS COMPOSITE MATERIAL WITH STAINLESS STEEL PARTICULATE FILLER

John A. Satkowski, Gaithersburg, Md.; Barry Scheetz, Lamont, Pa.; Janine M. Rizer, Waldorf, Md., and Carl Gotzmer, Accokeek, Md., assignors to Research One Limited Partnership, Towson, Md.

Filed Jun. 30, 1983, Ser. No. 509,677

Int. Cl.³ C04B *31/18*

U.S. Cl. 106—97 **15 Claims**

1. A cementitious composite material which comprises Portland cement and irregularly shaped stainless steel particles as the principal filler.

4,482,386

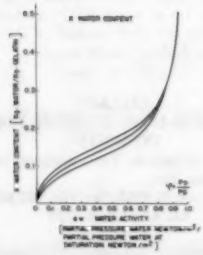
METHOD OF CONDITIONING A WATER SWELLABLE HYDROCOLLOID

Fritz Wittwer, Lupsingen, and Ivan Tomka, Bourguillon, both of Switzerland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 362,181, Mar., 1982, abandoned. This application Apr. 29, 1983, Ser. No. 490,058

Int. Cl.³ C08F *6/00;* **C08L** *1/08;* **C09H** *3/00;* **C09D** *3/04*

U.S. Cl. 106—135 **12 Claims**



1. A method by which a water-swellable hydrocolloid, for use in mechanical forming processes is conditioned to a given water content and is rapidly heated from a lower temperature to a higher temperature without virtually changing its water content, characterized by

(a) slowly conditioning the hydrocolloid at the lower temperature to obtain an even distribution of water within every particle and through the bulk of the hydrocolloid,

(b) transferring the hydrocolloid into a gaseous atmosphere of the desired higher temperature, said gaseous atmosphere is loaded with water to the proportion in equilibrium at the higher temperature with the predetermined water content of the hydrocolloid, and

(c) removing the hydrocolloid from the said gaseous atmosphere within a short time sufficient to heat the hydrocolloid to the desired higher temperature but not sufficient to affect any substantial exchange of humidity.

4,482,387

POWDERED WAX, TABLET COATED THEREWITH AND METHOD

Thomas G. Wood, East Brunswick, and Steven M. Oblack, South Plainfield, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 397,635, Jul. 12, 1982, Pat. No. 4,456,629. This application Dec. 2, 1983, Ser. No. 557,705

Int. Cl.³ C08L *91/06*

U.S. Cl. 106—270 **7 Claims**

1. A method for forming a powdered wax formulation which comprises milling frozen pieces of wax and dry ice to form a snow-like mixture, allowing the dry ice to evaporate from the mixture at a temperature of less than about 5° C. a dry powdered wax which is substantially free of clumps and having an average particle size of less than 100 microns, said wax comprises a wax selected of white wax, caranula wax and mixtures thereof.

4,482,388

METHOD OF REDUCING THE GREEN DENSITY OF A SLIP CAST ARTICLE

Gary M. Crosbie, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 7, 1983, Ser. No. 539,861

Int. Cl.³ C09K *3/00;* **C08K** *3/02*

U.S. Cl. 106—287.1 **7 Claims**

1. A method of reducing the green density of an article cast from a casting slip containing silicon particles, the method being characterized by the step of:

adding to the casting slip ingredients, a cationic polymer having a molecular weight in a range from 1,000 to 50,000.

4,482,389

NACREOUS PIGMENTS

Klaus-Dieter Franz, Kelkheim; Klaus Ambrosius, Frankfurt; Reiner Esselborn, and Manfred Kieser, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,869

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235017

Int. Cl.³ C09C *1/28*

U.S. Cl. 106—291 **14 Claims**

1. A nacreous pigment having good weathering stability, comprising a mica flake substrate coated with a first metal oxide layer and, thereon, a second layer comprising a chromium salt and one or both of a manganese salt and an iron salt, wherein the iron and manganese are deposited on the first-layer-containing pigments in the form of the hydroxide, carbonate or phosphate and the chromium is deposited on the first-layer-containing pigments in the form of the hydroxide, carbonate or phosphate or as methacrylato-chromium chloride.

4,482,390

METHOD OF PROTECTING PIGMENTS WITH TRANSPARENT CRYSTALLINE ZIRCON

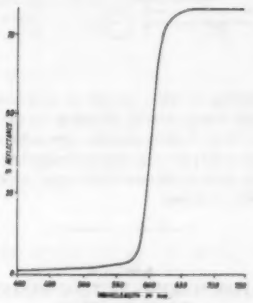
Anthony C. Airey, and Andrew Spiller, both of Stoke-on-Trent, England, assignors to British Ceramic Research Association Limited, Stoke-on-Trent, England

Filed Sep. 8, 1982, Ser. No. 415,813

Claims priority, application United Kingdom, Sep. 12, 1981, 8127615

Int. Cl.³ C09C 3/06

U.S. Cl. 106—308 B 6 Claims



1. A method of making a protected pigment by inclusion of a pigment in transparent zirconium silicate crystals comprising the steps of:

precipitating simultaneously from solutions of their salts a pigment and a zirconium compound;

thereafter, in the presence of the precipitate so formed, precipitating a silicon compound from a solution of its salts;

dry mixing the resulting precipitate with between 0.1 and 15 weight % of a metallic fluoride; heating the resulting mixture to a temperature between 800° C. and 1300° C. for a time of between 1 and 30 minutes;

cleaning the protected pigment so formed; and

wherein the pigment or its precursor is chosen from the group consisting of a sulphide, selenide or telluride of zinc, cadmium or mercury or a mixed crystal thereof, gold-tin pinks, gold-zirconium pinks, chrome yellows, cobalt-zinc blues and copper colors, or precursors thereof.

4,482,391

CLEANING METHOD AND APPARATUS FOR PARABOLIC CELLULAR LOUVERS FOR LIGHTING FIXTURES

Winslow L. Pettingell, Wood Dale, and John F. Hall, Addison, both of Ill., assignors to Foam Cutting Engineers, Inc., Addison, Ill.

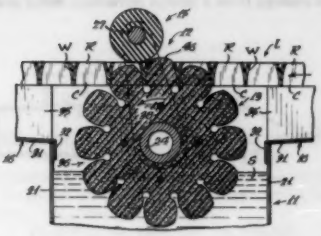
Filed Dec. 6, 1982, Ser. No. 447,391

Int. Cl.³ B08B 1/02; A47L 25/00

U.S. Cl. 134—6 20 Claims

1. Apparatus for cleaning a lighting fixture louver which has several rows of cells that are defined by parabolically curved wall means and that are open top and bottom, said apparatus comprising:

a cleaning roller the surface of which consists of circumferentially discrete longitudinal rows of individual cleaning lugs, the longitudinal and circumferential lug pitch being equal to the pitch of the louver cells with longitudinal and circumferential spacing between adjacent lugs substantially equal to the thickness of said cell walls, and each lug having a radial depth slightly greater than the louver depth and having arcuate perimetrical surfaces such that



the lug may scrub the surface of the entire wall means of a cell as it rolls through the cell.

4,482,392

CONDUIT CLEANING PROCESS

Charles B. Pollock; Patrick J. Murzyn; Stephen O. Brennom, all of Houston, and James N. Lambert, Missouri City, all of Tex., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 13, 1982, Ser. No. 377,788

Int. Cl.³ B08B 9/02

U.S. Cl. 134—7 39 Claims

1. An improved process for descaling and cleaning, in-situ, the interior surfaces of heat exchanger tubes having straight wall sections and a bend, or equivalent helical tube configurations, comprising:

(a) introducing cleaning particles having cylindrical configurations in which the diameter is greater than the length of said particles, or equivalent particle shapes, entrained in a propelling gas stream into said heat exchanger tubes to be descaled and cleaned at a gas flow rate corresponding to an outlet gas velocity of from about 5,000 feet per minute up to the sonic velocity of the propelling gas, said particles being of a regular, non-random configuration and having less than spherical symmetry, the cleaning particles impacting the bend and the straight sections at relatively sharp angles of impact for effective cleaning action, said particles assuming an aerodynamic orientation in the gas stream such as to result in a tumbling action upon impact with said bend and straight wall sections that minimizes abrasion of such bends; and

(b) maintaining the flow of said particle-entrained gas stream to the heat exchanger tubes for a time sufficient to effect cleaning in said tubes, whereby the impacts of the cleaning particles with the interior surfaces of the heat exchanger tubes to be descaled and cleaned, and the angle of impact of said particles with said interior surfaces, are such, due to said aerodynamic orientation of the particles in said gas stream, as to maximize desired descaling and cleaning action while minimizing undesired abrasive action so as to enhance the overall heat exchanger tube descaling and cleaning operation.

4,482,393

METHOD OF ACTIVATING IMPLANTED IONS BY INCOHERENT LIGHT BEAM

Kazuo Nishiyama, Kanagawa; Tetsunosuke Yanada, Tokyo, and Michio Arai, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,273

Claims priority, application Japan, Dec. 17, 1979, 54-163746

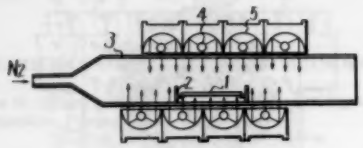
Int. Cl.³ H01L 21/265

U.S. Cl. 148—1.5 5 Claims

1. A process of manufacturing a semiconductor device comprising the steps of

(a) implanting impurity ions in a surface of a semimconductor substrate; and

(b) radiating continuously with a plurality of incoherent lights emitted from a heated refractory metal and having



a wave length of 0.4–4μm and with a beam width wider than said substrate, the intensity of said light beam such that the implanted region is annealed so as to be electrically activated.

4,482,394

METHOD OF MAKING ALUMINUM ALLOY FILM BY IMPLANTING SILICON IONS FOLLOWED BY THERMAL DIFFUSION

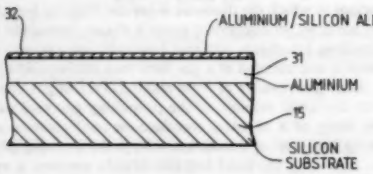
Rudolf A. H. Heinecke, Harlow, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 8, 1982, Ser. No. 415,969

Claims priority, application United Kingdom, Oct. 6, 1981, 8130106

Int. Cl.³ H01L *7/00, 21/265*

U.S. Cl. 148—1.5 **2 Claims**



1. A method of alloying a metal surface film on a body including implanting said film with ions of one or more alloying materials, by generating ions at a controlled rate in an ion beam, deflecting each ion in the beam by an angle corresponding to charge/mass ratio of the ions, and transmitting only ions of a predetermined charge/mass ratio to the metal surface, and in which the body is subsequently processed at one of a plurality of known temperatures.

4,482,395

SEMICONDUCTOR ANNEALING DEVICE

Tatsumi Hiramoto, Himeji, Japan, assignor to Ushio Denki Kabushikikaisha, Tokyo, Japan

Continuation of Ser. No. 221,763, Dec. 31, 1980, abandoned. This application Apr. 15, 1983, Ser. No. 485,373

Claims priority, application Japan, Feb. 1, 1980, 55-9965

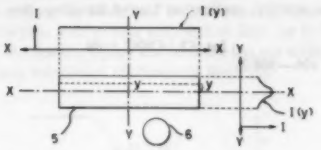
Int. Cl.³ H01L *21/324*

U.S. Cl. 148—1.5 **7 Claims**

1. A uniform, rapid and low-energy semiconductor annealing method comprising the steps of:

(a) providing an elongated uniform irradiation area by an incoherent light source whose emitted light is controlled so that a peak curve of the illuminance distribution is provided along the elongated irradiation area which is substantially linear and equiluminous curves are provided near the peak curve which are substantially linear and parallel therewith; and

(b) continuously moving a semiconductor wafer and the elongated irradiation area relative to each other, wherein the entire area of the semiconductor wafer to be annealed transversely crosses all the substantially parallel and linear equiluminous curves for holding the direction in which the temperature distribution over the heated portion of the



wafer undergoes wavy variations at a constant angle to the crystal orientation at all points on the wafer surface area and for providing uniform temperature and thermal hysteresis at all points on the wafer surface area, whereby the entire area of the semiconductor wafer is uniformly and rapidly annealed.

4,482,396

METHOD FOR MAKING PITTING RESISTANT CAST IRON PRODUCT

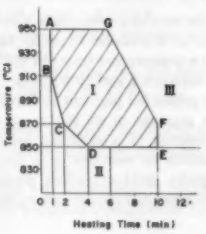
Yukio Yamamoto, and Masashi Yoritaka, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 25, 1983, Ser. No. 526,531

Claims priority, application Japan, Aug. 26, 1982, 57-148059

Int. Cl.³ C21D *5/00*

U.S. Cl. 148—3 **1 Claim**



1. A method for making a pitting resistant cast iron product, which comprises the steps of:

casting a cast iron of a composition containing 2.8 to 3.8% of C, 1.8 to 2.8% of Si, 0.5 to 1.0% of Mn, 0.2 to 1.0% of Cu, 0.2 to 1.0% of Ni, 0.5 to 1.5% of Cr, 0.4 to 1.5% of Mo, up to 0.15% of P, up to 0.1% of S and Fe being the balance, so as to form a casting having a chilled structure at that portion of the casting which serves as a sliding face, said chilled structure containing 30 to 50% of cementite precipitated therein;

annealing the resultant casting at 550° to 630° C. for 20 to 60 minutes;

machining the annealed casting;

subjecting the machined casting to a quenching treatment by heating it, to a temperature of between 850° and 950° C. for a time of from 1 to 10 minutes within the area I bounded by points A, B, C, D, E, F and G in FIG. I, and then quenching it to produce the product having a martensite matrix with no cementite decomposed; and

tempering the product at 100° to 250° C. for a predetermined time not longer than 120 minutes.

4,482,397

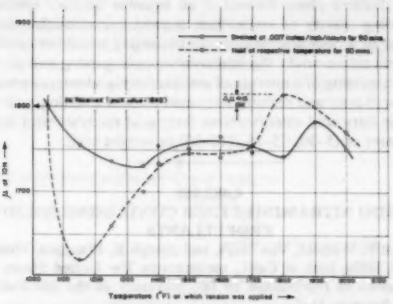
METHOD FOR IMPROVING THE MAGNETIC PERMEABILITY OF GRAIN ORIENTED SILICON STEEL

Amitava Datta, Morris Township, Morris County, N.J., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 295,592, Aug. 24, 1981, abandoned. This application Mar. 15, 1983, Ser. No. 475,425

Int. Cl.[3] H01F *1/04*

U.S. Cl. 148—111 5 Claims



1. In a method for producing cube-on-edge oriented silicon steel, characterized by improved magnetic permeability, including the steps of hot rolling, cold rolling with or without intermediate annealing and a final texture annealing, the improvement comprising cold rolling the steel with a final reduction of greater than about 70%, normalizing said steel to effect decarburization and primary recrystallization and tensile straining said steel after cold rolling and prior to final texture annealing to promote secondary recrystallization during said final texture annealing.

4,482,398

METHOD FOR REFINING MICROSTRUCTURES OF CAST TITANIUM ARTICLES

Daniel Eylon, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1984, Ser. No. 574,433

Int. Cl.[3] C22F *1/18*

U.S. Cl. 148—11.5 F 11 Claims

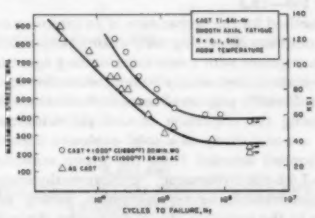


Fig. 4

1. A process for improving the microstructure of a cast titanium article which comprises the steps of:

a. providing a cast titanium article;

b. beta-solution heat treating said cast article at a temperature approximately equal to the beta-transus temperature of said article;

c. cooling said article at a rate in excess of air cooling to room temperature;

d. aging said article at a temperature in the approximate range of 0.80 to 0.90 times said beta-transus temperature for about 4 to 36 hours; and

e. air cooling said article to room temperature.

4,482,399

NITRIDED CAST IRON PRODUCT AND METHOD FOR MANUFACTURING THE SAME

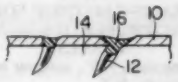
Tuyoshi Morishita; Toshihiko Hattori; Yashuhumi Kawado, and Kouji Tarumoto, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 24, 1983, Ser. No. 525,932

Claims priority, application Japan, Aug. 26, 1982, 57-148174; Sep. 16, 1982, 57-161276

Int. Cl.[3] B32B *15/08;* C21D *1/10*

U.S. Cl. 148—31.5 7 Claims



1. A nitrided cast iron product consisting essentially of cast iron matrix material and graphite particles distributed in said matrix material, a nitrided layer formed on a surface of said cast iron product and having gaps between said graphite particles and said matrix material, said gaps being exposed to the surface of said product and filled with resin which has a resistance to dissolution under a temperature below 250° C.

4,482,400

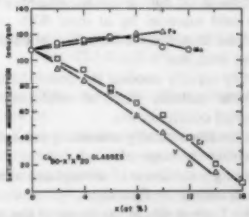
LOW MAGNETOSTRICTION AMORPHOUS METAL ALLOYS

Robert C. O'Handley, Bedford Hills, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 25, 1980, Ser. No. 133,775

Int. Cl.[3] C22C *19/07*

U.S. Cl. 148—31.55 3 Claims



1. A magnetic alloy that is at least about 50 percent glassy and consists essentially of a composition having the formula $(Co_{1-x}T_x)_{100-b}(B_{1-y}Y_y)_b$ where T is at least one of chromium and vanadium, Y is at least one of carbon, silicon, phosphorous and germanium, x ranges from about 0.05 to 0.25, y ranges from about 0 to 0.75, and b ranges from about 14 to 28 atom percent, plus incidental impurities, said alloy having a value of magnetostriction of about -6×10^{-6} to 4×10^{-6} and a saturation induction of about 0.2 to 1.0T.

4,482,401

METHOD FOR PRODUCING CUBE-ON-EDGE ORIENTED SILICON STEEL

Robert F. Miller, Evans City, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 399,680, Jul. 19, 1982, abandoned. This application Nov. 15, 1983, Ser. No. 551,515
Int. Cl.³ H01F 1/04
U.S. Cl. 148—111 4 Claims

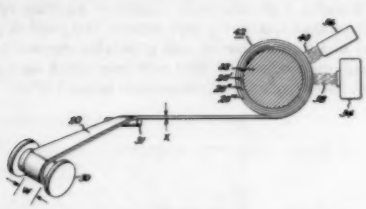
1. In a method for producing cube-on-edge oriented silicon steel, characterized by reduced watt loss, including the steps of hot-rolling, cold-rolling with intermediate annealing, slurry coating and a final texture annealing, the improvement comprising surface coating spaced regions of said steel with a manganese-bearing material after cold rolling and prior to texture annealing and texture annealing said steel with said manganese-bearing coating thereon for manganese to interact with solute sulfur in the steel, whereby secondary grain growth is inhibited during texture annealing.

4,482,402

DYNAMIC ANNEALING METHOD FOR OPTIMIZING THE MAGNETIC PROPERTIES OF AMORPHOUS METALS

Alan I. Taub, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 364,299, Apr. 1, 1982,. This application Aug. 1, 1983, Ser. No. 519,279
Int. Cl.³ H01F 1/00
U.S. Cl. 148—121 13 Claims



1. A method for dynamically annealing amorphous metallic material comprising the steps of:

(a) forming a single thickness of amorphous metallic material to a predetermined configuration;

(b) heating the formed single thickness of amorphous metallic material to the highest peak temperature at the most rapid heating rate attainable subject to the proviso that substantially no crystallization is induced in said material in the time required during this heating step to reduce the stresses in said material by at least 90% of the stresses present in said material immediately prior to initiation of said heating step; and

(c) immediately rapidly cooling the formed single thickness of amorphous metallic material while maintaining said predetermined configuration.

8. A method for dynamically annealing amorphous metallic material comprising the steps of:

(a) forming a single thickness of amorphous metallic material to a predetermined configuration;

(b) heating the formed single thickness of amorphous metallic material to the highest peak temperature attainable at a rate greater than about 300° C./min subject to the proviso that substantially no crystallization is induced in said material in the time required during this heating step to reduce the stresses in said material by at least 90% of the stresses present in said material immediately prior to initiation of said heating step; and

(c) immediately rapidly cooling the formed signal thickness of amorphous metallic material while maintaining said predetermined configuration.

4,482,403

WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Fumio Takeuchi; Masao Takahashi, and Hiroshi Sakai, all of Chita, Japan, assignors to Nippon Oil and Fats Company, Limited, Japan

Filed Mar. 20, 1984, Ser. No. 591,671
Claims priority, application Japan, May 10, 1983, 58-80005
Int. Cl.³ C06B 45/00
U.S. Cl. 149—2 2 Claims

1. In a water-in-oil emulsion explosive composition comprising a disperse phase formed of an aqueous oxidizer solution consisting mainly of ammonium nitrate; a continuous phase formed of a combustible material consisting of oil; an emulsifier; and micro-voids, the improvement comprising said emulsifier consisting of a mixture of sorbide fatty acid ester, sorbitan fatty acid ester and sorbitol fatty acid ester in a mixing ratio of sorbide fatty acid ester/sorbitan fatty acid ester/sorbitol fatty acid ester of (5–30)/(5–75)/(15–90) in weight basis.

4,482,404

AZIDO NITRAMINO ETHER CONTAINING SOLID PROPELLANTS

Edward F. Witucki, Van Nuys, and Joseph E. Flanagan, Woodland Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 366,745, Apr. 8, 1982,. This application Dec. 6, 1983, Ser. No. 558,675
Int. Cl.³ C06B 45/10
U.S. Cl. 149—19.1 3 Claims

1. A solid composite type propellant composition comprising a cured intimate mixture of:

A. a solid, particulate oxidizer component;

B. a synthetic resinous binder component; and

C. an azido nitramino ether energetic plasticizer selected from the group consisting of bis (2-azidoethoxymethyl nitramine and 1, 12-diazido-3, 10-dioxa-5,8-dinitrazadodecane and wherein said plasticizer is present in a ratio ranging from about 1.5 to 4.0 parts of plasticizer to about 1.0 parts of resinous binder.

4,482,405

EXPLOSIVE MOLDING COMPOSITION AND METHOD FOR PREPARATION THEREOF

Sam B. Wright, Holston Ordnance, Kingsport, Tenn. 37660

Filed Aug. 18, 1960, Ser. No. 50,311
Int. Cl.³ C06B 45/10
U.S. Cl. 149—19.3 6 Claims

1. A method for the preparation of an explosive composition which comprises dispersing with mixing polytetrafluoroethylene resin together with a non-ionic wetting agent in sufficient water to make a substantially homogeneous dispersion containing about 55–65% polytetrafluoroethylene resin solids, adding with mixing the dispersion of said polytetrafluoroethylene resin to a water slurry of a solid explosive capable of being plastic bonded selected from the group consisting of 1,3-diamino-2,4,6-trinitrobenzene, cyclotrimethylenetrinitramine and cyclotetramethylenetetranitramine, slowly adding with agitation to the explosive slurry containing the polytetrafluoroethylene resin a coagulating water-miscible organic solvent selected from the group consisting of methyl alcohol, ethyl alcohol, n-propyl alcohol, isopropyl alcohol and mixtures thereof, and recovering a coagulated bonded explosive, said polytetrafluoroethylene resin amounting to from 2–10% by weight of the explosive composition.

5. An explosive composition consisting essentially of particulate explosive material comprising cyclotrimethylene trinitramine coated with solid polytetrafluoroethylene in discrete particles of average size of about 0.2 microns and constituting from about 2 to about 10% by weight of the coated particles.

4,482,406

PROPELLANT PLASTICIZER

William D. Stephens, Huntsville, Ala., and Erin G. Nieder, Manassas, Va., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 3, 1983, Ser. No. 491,111
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **3 Claims**

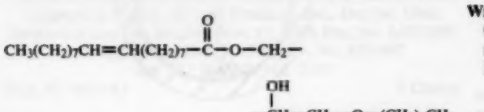
1. A solid propellant for use in a rocket motor comprising a mixture of:

a fuel;

an oxidizer for combusting said fuel;

a binder for holding said fuel and said oxidizer comprising hydroxy-terminated polybutadiene;

a nonmigrating plasticizer attaching to said binder and having the structural formula:



a bonding agent;

a curing agent comprising a polyisocyanate; and

a cure catalyst to react with said curing agent to solidify said mixture.

4,482,407

PLASTICIZER SYSTEM FOR PROPELLANT COMPOSITIONS

William D. Stephens, Huntsville, Ala., and Brenda K. Rodman, Catlett, Va., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

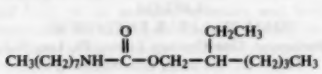
Filed May 23, 1983, Ser. No. 497,445
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **1 Claim**

1. A solid propellant composition comprising a cured homogenous mixture of:

A. a solid, particulate oxidizer component;

B. a synthetic resinous, isocyanate cured, polybutadiene binder component; and

C. a carbamic acid ester plasticizer having the following structural formula:



wherein said plasticizer is present in a binder/plasticizer ratio ranging from about 75 to 95 parts by weight of binder to 5 to 25 parts by weight of plasticizer.

4,482,408

PLASTICIZER SYSTEM FOR PROPELLANT COMPOSITIONS

William D. Stephens, Huntsville, Ala., and Brenda K. Rodman, Catlett, Va., assignors to The United States of Amercia as represented by the Secretary of the Air Force, Washington, D.C.

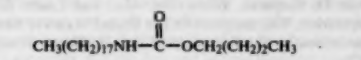
Filed May 23, 1983, Ser. No. 497,456
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **1 Claim**

1. A solid propellant composition comprising a cured homogeneous mixture of:

A. a solid, particulate, oxidizer component;

B. a synthetic resinous, polyisocyanate cured, polybutadiene binder component; and

C. a carbamic acid ester plasticizer having the following structural formula:



wherein said plasticizer is present in a binder plasticizer ratio ranging from about 75 to 95 parts by weight of binder to 5 to 25 parts by weight of plasticizer.

4,482,409

PLASTICIZER SYSTEM FOR PROPELLANT COMPOSITIONS

William D. Stephens, Huntsville, Ala., and Brenda K. Rodman, Catlett, Va., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

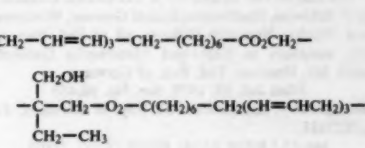
Filed May 23, 1983, Ser. No. 497,457
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **1 Claim**

1. A solid propellant composition comprising a cured homogenous mixture of:

A. a solid, particulate, oxidizer component;

B. a synthetic resinous, polyisocyanate cured, polybutadiene binder component; and

C. a lineoleate ester plasticizer having the following structural formula:



4,482,410

PLASTICIZER SYSTEM FOR PROPELLANT COMPOSITIONS

William D. Stephens, Huntsville, Ala., and Linda E. Jones, Haymarket, Va., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

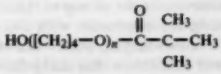
Filed May 23, 1983, Ser. No. 497,458
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **1 Claim**

1. A solid propellant composition comprising a cured homogenous mixture of:

A. a solid, particulate oxidizer component;

B. a synthetic resinous, polyisocyanate cured, polybutadiene binder component; and

C. a polytetramethyleneglycol pivalate ester plasticizer having the following structual formula:



wherein n is an integer of from 6 to 12 and said plasticizer is present in a binder/plasticizer ratio ranging from about 75 to 95 parts by weight of binder to 5 to 25 parts by weight of plasticizer.

4,482,411
PLASTICIZER SYSTEM FOR PROPELLANT COMPOSITIONS

William D. Stephens, Huntsville, Ala., and Linda E. Jones, Haymarket, Va., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 23, 1983, Ser. No. 497,459
Int. Cl.³ C06B 45/10
U.S. Cl. 149—19.4 1 Claim

1. A solid propellant composition comprising a cured homogenous mixture of:

A. a solid, particulate oxidizer component;

B. a synthetic resinous, isocyanate cured, polybutadiene binder component; and

C. a polytetramethyleneglycol monooctaneoate plasticizer having the following structural formula:

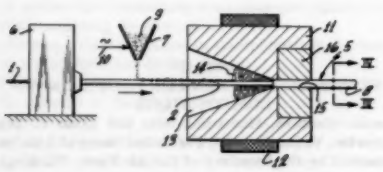
$$HO([CH_2]_4-O)_n-\overset{O}{\overset{\|}{C}}-(CH_2)_6-CH_3$$

wherein n is an integer of from 6 to 12 and said plasticizer is present in a binder/plasticizer ratio ranging from about 75 to 95 parts by weight of binder to 5 to 25 parts by weight of plasticizer.

4,482,412
METHOD OF MAKING A COAXIAL CABLE

Eckhardt Schleese, Stadthagen; Rudolf Gessner, Wedemark, and Horst Manke, Nienstädt-Sülbeck, all of Fed. Rep. of Germany, assignors to Kabel-und Metalwerke Gutehoffnungshuette AG, Hanover, Fed. Rep. of Germany

Filed Jul. 10, 1979, Ser. No. 56,433
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827337
Int. Cl.³ B32B 27/00; H01B 11/00, 13/06
U.S. Cl. 156—51 4 Claims



1. A method of making a coaxial cable with accurate spacing between inner and outer conductor, comprising the steps of

providing an inner conductor:

extruding an insulation layer onto the inner conductor, and at a thickness so that radial dimensions are on the average close to, but not exceeding, radial dimensions of the coaxial cable as regards spacing between the inner conductor and a concentric outer conductor later placed arount it;

moving the inner conductor with extruded insulation in horizontal direction;

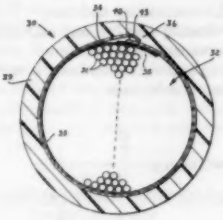
pouring an insulative powder on top of the extruded insulation and passing the conductor with the insulation and powder into a funnel-shaped, heated drawing die to melt the powder and distribute a thin sizing film onto the core in order to, thereby, determine the radial dimension thereof; and

subsequently forming the outer conductor around the core in intimate contact with the film, the film serving as an adhesive for the outer conductor.

4,482,413
METHODS OF AND APPARATUS FOR FORMING STRIPS OF NON-METALLIC AND METALLIC MATERIAL INTO TUBULAR COVERS HAVING OVERLAPPED SEAMS

William D. Bohannon, Jr., Lawrenceville, and Alfred S. Hamilton, Norcross, both of Ga., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,307
Int. Cl.³ H01B 13/26
U.S. Cl. 156—54 23 Claims



1. A method of forming non-metallic and metallic covers about a cable core, said method including the steps of:

moving a cable core, a strip of relatively flexible non-metallic material and a strip of metallic material along a path of travel; while

forming the strips along one portion of the path of travel to cause each to enclose partially the core;

providing a passageway along another portion of the path of travel which converges in the direction the core is being moved to cause longitudinal edge portions of each strip to be moved circumferentially of the core;

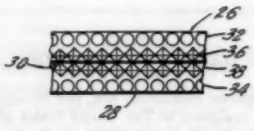
causing the longitudinal edge portions of the partially formed non-metallic strip to be separated in a direction radially of the path of travel without restricting their movement circumferentially of the core; and then

confining one longitudinal edge portion of the non-metallic strip and the longitudinal edge portions of the metallic strip along a portion of the converging passageway to control the relative circumferential movement between the edge portions of each strip and cause each strip to be formed into a tubular cover with an overlapped seam having a predetermined configuration.

4,482,414
FOAM-FILLABLE ENCLOSURE

Milton Schonberger, One Century Tower, Ft. Lee, N.J. 07024

Filed Oct. 31, 1983, Ser. No. 547,247
Int. Cl.³ B32B 1/04, 1/06, 3/18
U.S. Cl. 156—79 20 Claims



15. A method of forming a unit to define an enclosure for generation and containment of foam therein, the method comprising:

coating a first foaming agent on one inwardly facing surface of a first layer comprised of a flexible material which defines the enclosure;

coating a second foam-forming agent on a second inwardly facing surface of a second layer of a flexible material

which defines the enclosure, wherein the first and second surfaces face each other and are opposite each other;

wherein at least one of the agents is encapsulated in rupturable capsules comprised of a material which contains the one agent and which material does not react with the other agent, and the capsules are for preventing mixing of the first and second agents, the capsules being adapted to be ruptured for releasing the agent encapsulated, whereby upon capsule rupture, the agents come into contact and react to generate foam in the enclosure.

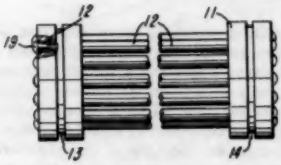
20. A method for producing a foam-filled enclosure, comprising forming the unit according to claim **15**, and thereafter rupturing the capsules for freeing the one agent to contact the other agent for generating foam in the enclosure.

4,482,415

SEALING MECHANICAL TUBE JOINTS

Charles B. Mort, and Dennis W. DeSalve, both of Findlay, Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Division of Ser. No. 207,260, Nov. 17, 1980, Pat. No. 4,453,301.
This application Dec. 9, 1983, Ser. No. 559,967
Int. Cl.[3] **B32B** *31/16, 7/04*
U.S. Cl. 156—91 **7 Claims**



5. A method of sealing mechanical tube joints in a tube and shell type heat exchanger, including the steps of:

a. providing a pair of header plates each with multiple relatively closely spaced apart tube accommodating through holes;

b. installing tubes between said header plates, tube ends being received in respective tube accommodating through holes in said header plates;

c. expanding tube ends to achieve a relatively close fitting contact of exteriors thereof with surrounding header wall surfaces defining said through holes forming thereby a tube and header plate assembly;

d. immersing at least one end portion of said assembly into a liquid body of an anerobic adhesive and holding it so immersed while the liquid material travels by capillary action into voids between tube and exteriors and said surrounding header wall surfaces; and

e. removing the tube and header plate assembly from the body of the anerobic adhesive and allowing retained liquid material to cure.

4,482,416

METHOD OF FOLDING ANNULAR BAND

Takashi Yasukochi, Tokorozawa, and Yoshihiro Fukamachi, Higashimurayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,834
Claims priority, application Japan, Aug. 24, 1981, 56-132314
Int. Cl.[3] **B29H** *17/00*
U.S. Cl. 156—133 **2 Claims**

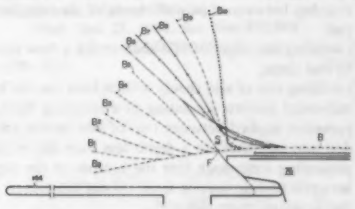
1. A method of folding an annular resilient band about a circumferential fold line, comprising the steps of:

wrapping the annular band on a generally cylindrical drum structure which has a center axis therethrough, a cylindrical external contour about the center axis and an annular zone radially inward of the cylindrical external contour the drum structure being radially collapsible about the center axis thereof, the band being wrapped on the drum structure with an inflatable annular first bladder positioned in such a manner as to have a folded-over axial end portion of the first bladder axially protruding into said annular zone and with an inflatable annular second bladder positioned radially inwardly of the first bladder and in such a manner that the first and second bladders have axial portions overlapping each other, the band wrapped on the drum structure having an axial end portion axially protruding from an axial end of the drum structure,

inflating the first bladder to a predetermined medium expanded state so that said axial end portion of the band on the drum structure is contacted by the bladder and displaced radially outwardly, the first bladder being inflated to an expanded state minor to said medium expanded state so as to have its outer peripheral surface substantially aligned with said cylindrical external contour of the drum structure, the first bladder being moved away from the drum structure after the first bladder is inflated to said medium expanded state,

moving the first bladder a predetermined distance axially away from the drum structure for forming an annular gap between the first bladder and said axial end portion of the band, and

inflating the second bladder to a fully expanded state for deforming the first bladder axially between the band and the second bladder so that said axial end portion of the band is caused to further turn about said fold line until the axial end portion of the band is received on an adjacent axial portion of the band.



2. A method of folding an annular resilient band about a circumferential fold line, comprising the steps of:

wrapping the annular band on a generally cylindrical drum structure which has a center axis therethrough, a cylindrical external contour about the center axis and an annular zone radially inward of the cylindrical external contour, the drum structure being radially collapsible about the center axis thereof, the band being wrapped on the drum structure with an inflatable annular first bladder positioned in such a manner as to have a folded-over axial end portion of the first bladder axially protruding into said annular zone and with an inflatable annular second bladder positioned radially inwardly of the first bladder and in such a manner that the first and second bladders have axial portions overlapping each other, the band wrapped on the drum structure having an axial end portion axially protruding from an axial end of the drum structure,

inflating the first bladder to a predetermined medium expanded state so that said axial end portion of the band on the drum structure is contacted by the bladder and displaced radially outwardly, the first bladder being inflated to an expanded state minor to said medium expanded state so as to have its outer peripheral surface substantially aligned with said cylindrical external contour of the drum structure, said first bladder being moved away from the drum structure while the first bladder is being inflated to said medium expanded state,

moving the first bladder a predetermined distance axially away from the drum structure for forming an annular gap

between the first bladder and said axial end portion of the band, and

inflating the second bladder to a fully expanded state for deforming the first bladder axially between the band and the second bladder so that said axial end portion of the band is caused to further turn about said fold line until the axial end portion of the band is received on an adjacent axial portion of the band.

4,482,417

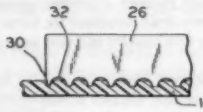
HINGE FOR THERMOPLASTIC MATERIAL

Loren J. Hulber, Naperville, and Raymond W. Fluckiger, Chicago, both of Ill., assignors to Jostens, Inc., Minneapolis, Minn.

Division of Ser. No. 253,245, Apr. 13, 1981,. This application May 2, 1983, Ser. No. 490,382

Int. Cl.³ B31F *1/20;* **B29C** *19/02, 19/06, 17/00*

U.S. Cl. 156—219 **5 Claims**



2. A process for constructing a hinged loose-leaf binder cover, comprising:

(a) placing a plurality of flat rigid inserts in co-planar relationship between a pair of sheets of thermoplastic material;

(b) welding the edges of said sheets with a heat source so as to seal them;

(c) welding one of said sheets with at least one die having an embossed pattern consisting of alternating teeth and depressions applied between two of said inserts and embedded into said sheet to a depth less than the height of the projecting teeth such that the bottom of the depressions between said projecting teeth do not contact or weld the thermoplastic material; and

(d) cooling said thermoplastic material until it hardens, whereby said projecting teeth create indentations in said sheet which are spaced apart by non-welded regions of said sheet.

4,482,418

BONDING METHOD FOR PRODUCING VERY THIN BOND LINES

Eugene B. Rigby, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 17, 1983, Ser. No. 524,167

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—276 **12 Claims**

1. A method of diffusion bonding one member to another, to form a very thin bond line therebetween, comprising:

a. providing a first colloid solution having a polarity;

b. providing a second colloid solution having an opposite polarity;

c. dipping at least one of said surfaces in said first solution;

d. removing said one surface, and thereafter washing, to leave a monolayer of said first colloid;

e. dipping said one surface in said second solution;

f. removing said one surface, and thereafter washing, to leave a monolayer of said second colloid; and

g. placing the two surfaces to be in contact in a high-heat/-high-pressure environment in order to effect a diffusion bond therebetween, the bond-line thickness being determined by the thickness of at least one of the layers of said first and second colloid.

4,482,419

DRY ETCHING APPARATUS COMPRISING ETCHING CHAMBERS OF DIFFERENT ETCHING RATE DISTRIBUTIONS

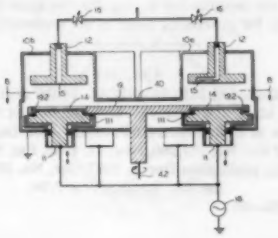
Tsutomu Tsukada; Etsuo Wani; Katsumi Ukai, and Teruo Saitoh, all of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,143

Claims priority, application Japan, Feb. 3, 1983, 58-15527

Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/00*

U.S. Cl. 156—345 **8 Claims**



1. A dry etching apparatus comprising first and second etching chamber groups, each of which comprises an etching chamber comprising a first and a second electrode member having a first and a second principal surface, respectively, said first and said second principal surfaces opposing each other, said first and said second etching chamber groups being for successively etching an object placed on a predetermined one of the first and the second principal surfaces in each etching chamber with different distributions of etching rate on the predetermined ones of the first and the second principal surfaces in the etching chambers of the respective etching chamber groups.

4,482,420

APPARATUS FOR PRODUCING COMPOSITE PIPES

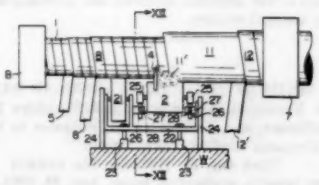
Hisao Morimoto, Nagaokakyo; Toshimi Inai, Kyoto, and Takashi Shimizu, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 349,665, Feb. 17, 1982, Pat. No. 4,412,882, which is a continuation-in-part of Ser. No. 175,043, Aug. 4, 1980, abandoned, which is a continuation of Ser. No. 3,943, Jan. 16, 1979, abandoned. This application Sep. 14, 1983, Ser. No. 532,053

Claims priority, application Japan, Jan. 20, 1978, 53-5557

Int. Cl.³ B65C *9/04;* **B44C** *7/00;* **B05C** *3/02;* **B28B** *17/00*

U.S. Cl. 156—392 **1 Claim**



1. An apparatus for use in producing a composite pipe, which comprises:

a cylindrical mold rotatable around its cylindrical axis and movable axially while rotating for having a reinforcing material containing a binder wrapped around the mold spirally to form an inside surface layer thereon;

a thickness regulating roller having an axis of rotation and

positioned at a predetermined distance from the surface of said layer corresponding to a desired thickness of the pipe and defining a converging space with said mold;

supporting means for supporting said thickness regulating roller;

means for feeding a molding material containing a binder into said converging space; and

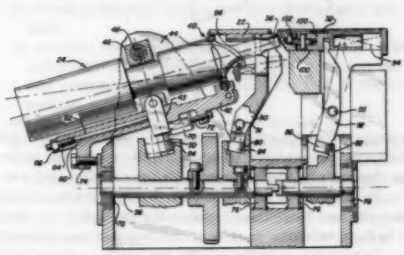
a contacting roller having a rotating shaft coaxial or parallel with the axis of rotation of said thickness regulating roller and fixed to the supporting means and having the periphery of said contacting roller contacting said inside surface layer for maintaining said thickness regulating roller at said position.

4,482,421

ULTRASONIC FRICTION-FUSION METHOD AND APPARATUS

Ronald W. Gurak, Fox River Grove, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jun. 2, 1982, Ser. No. 384,221
Int. Cl.³ B29C *27/08*; B65B *13/32*
U.S. Cl. 156—580.1 **4 Claims**



1. Apparatus for securing a thermoplastic strap around a package or the like comprising: a support structure; means for placing a strap around a package and forming a tensioned loop having overlapped strap portions, an anvil reciprocably supported by said support structure, pivotally mounted ultrasonic means located on said support structure adjacent said overlapped strap portions, said support structure connected to said ultrasonic means solely at the nodal area of the ultrasonic means whereby it is supported in a vibration-free area relative to said support structure, said ultrasonic means including a tip portion having a side surface disposed adjacent said overlapped strap portions, means for effecting relative movement between said anvil and tip to compress the overlapping strap portions therebetween and means for operating said ultrasonic means to move said tip longitudinally and an adjacent overlapping strap portion at a very high frequency in a transverse direction relative to the adjacent overlapped strap portion to effect bodily sliding frictional movement between the overlapping strap portions to melt the interface regions therebetween.

4,482,422

METHOD FOR GROWING A LOW DEFECT MONOCRYSTALLINE LAYER ON A MASK

Joseph T. McGinn, Flemington; Lubomir L. Jastrzebski, Plainsboro, and John F. Corboy, Jr., Ringoes, all of N.J., assignors to RCA Corporation, New York, N.Y.

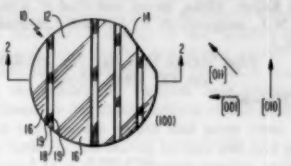
Filed Feb. 26, 1982, Ser. No. 352,883
Int. Cl.³ C30B *25/04*
U.S. Cl. 156—612 **13 Claims**

1. A method for forming a low-defect monocrystalline layer on a mask, comprising the steps of:

providing a substrate having a monocrystalline surface portion of predetermined crystallographic orientation;

forming a mask on the substrate, the mask including an aperture which is disposed over the monocrystalline surface portion and which is shaped such that substantially all of its edges are parallel to a predetermined crystallographic direction on the monocrystalline surface portion; and

epitaxially depositing a crystalline material having crystallographic slip planes therein, such that the material forms a



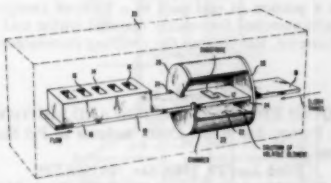
monocrystalline layer on the substrate surface portion and grows in a predetermined crystallographic direction over the mask, said predetermined crystallographic direction being perpendicular to said aperture edges and being the direction which is furthest from the slip planes within said monocrystalline layer.

4,482,423

PROTECTION OF SEMICONDUCTOR SUBSTRATES DURING EPITAXIAL GROWTH PROCESSES

Paul R. Besomi, Plainfield; Ronald J. Nelson, Berkeley Heights, and Randall B. Wilson, Edison, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 25, 1982, Ser. No. 392,065
Int. Cl.³ C30B *19/06*
U.S. Cl. 156—622 **10 Claims**



1. A liquid phase epitaxy method of fabricating a semiconductor device by growing an epitaxial layer on a compound semiconductor single crystal substrate containing a relatively volatile element, comprising the steps of:

providing a solution holder having a well therein containing a first solution from which said layer is to be grown,

providing a slider having a recess therein for carrying said substrate to a position under said well, providing a chamber which

(1) is located external to said solution holder,

(2) is adapted to permit said slider to translate therethrough,

(3) is capable of surrounding said substrate,

(4) has a bottom portion underneath said slider and a top portion above said slider,

placing a second solution, which contains said volatile element, into said bottom portion of said chamber,

moving said slider to position said substrate in said chamber

heating said substrate and said solutions to a temperature suitable for growth of said layer and which causes said volatile element to evaporate from said second solution,

so that the partial pressure of said volatile element in said chamber reduces thermal decomposition of said substrate, and

removing said substrate from said chamber and bringing it

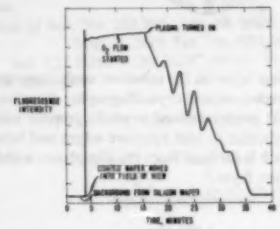
into contact with said first solution for a time period effective to grow said layer to the desired thickness.

4,482,424

METHOD FOR MONITORING ETCHING OF RESISTS BY MONITORING THE FLOURESENCE OF THE UNETCHED MATERIAL

Abraham Katzir, Afeka, Israel, and Paul R. Kolodner, Maplewood, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 6, 1983, Ser. No. 492,433
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—626 **16 Claims**



1. A method for fabricating a device, said method comprising the steps of:

forming a sacrificial coating material on a substrate; and

etching at least a part of said material,

Characterized In That

said material includes fluorescent material, and

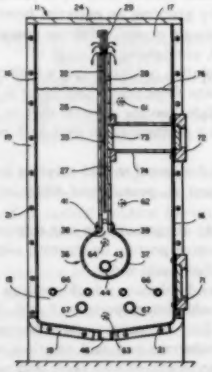
said method further comprises the step of monitoring the etching of said sacrificial coating material by subjecting at least a portion of said part to a form of energy which induces unetched fluorescent material within said portion to fluoresce, and sensing the resulting fluorescence.

4,482,425

LIQUID ETCHING REACTOR AND METHOD

James F. Battey, Los Altos, Calif., assignor to Psi Star, Inc., Hayward, Calif.

Filed Jun. 27, 1983, Ser. No. 508,525
Int. Cl.³ C23F *1/00;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—637 **23 Claims**



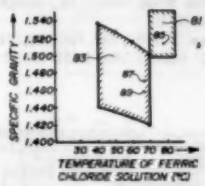
5. In a method for removing material by etching from a substrate, the steps of placing the substrate in a relatively narrow channel of slightly greater dimension than the substrate, and passing a liquid etchant through the channel at a flow rate such that the composition of the etchant does not change significantly from one end of the substrate to the other as the material is removed from the substrate.

4,482,426

METHOD FOR ETCHING APERTURES INTO A STRIP OF NICKEL-IRON ALLOY

Richard B. Maynard, Colerain Township, Lancaster County; John J. Moscony, Manheim Township, Lancaster County, and Margaret H. Saunders, East Lampeter Township, Lancaster County, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,933
Int. Cl.³ C23F *1/02;* **B44C** *1/22;* **C03C** *15/00*
U.S. Cl. 156—640 **18 Claims**



1. A method for etching apertures into a strip of iron-nickel alloy, said strip having etch-resistant stencils on opposite major surfaces thereof, said method comprising contacting said stencilled major surfaces of said strip with ferric-chloride etchant (a) containing not more than 5 molar percent nickel ion with respect to the total molar content of nickel and iron ions in said etchant, (b) having a specific gravity greater than about 1.495 (48° Baumé) and (c) having a temperature greater than 70° C.

4,482,427

PROCESS FOR FORMING VIA HOLES HAVING SLOPED WALLS

Hiroyuki Hiraoka, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1984, Ser. No. 612,189
Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06;* **B29C** *17/08*
U.S. Cl. 156—643 **6 Claims**

1. A completely dry process for forming via holes having sloped sidewalls, said process comprising the steps of:

(1) covering a substrate with an organic polymer film,

(2) positioning a mask above the organic polymer film at a distance of from 20 to 200 microns, and

(3) exposing said polymer film to oxygen reactive ion etching through said mask, which has perforations therethrough, but which is otherwise impervious to the oxygen reactive ion etching, until holes are etched through the polymer film in registration with the perforations in the mask.

4,482,428

SMOOTH-LOOK FOOTWEAR PROCESS

Karl A. Karim, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1984, Ser. No. 603,057
Int. Cl.³ B29C *17/08;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—668 **6 Claims**

1. A process for dulling molded block copolymer compositions comprising contacting the surface of a molded block copolymer rubber composition with a chromic acid etching solution, optionally rinsing and drying.

4,482,429

PAPER WEBS HAVING HIGH BULK AND ABSORBENCY AND PROCESS AND APPARATUS FOR PRODUCING THE SAME

Bernard G. Klowak, Neenah, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.

Division of Ser. No. 182,835, Aug. 29, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,748

Int. Cl.³ D21H 5/24

U.S. Cl. 162—111 3 Claims

1. A paper web product comprising a web of kraft fibers bonded together solely by natural hydrogen bonding between the fibers and with debonding agent mixed therein, and having a basis weight of at least 13.77 pounds per 3,000 square feet, a machine direction tensile strength of at least 34 grams per centimeter, a cross direction tensile strength of at least 12 grams per centimeter, a caliper for 8 plys as measured under 26.6 grams per square centimeter pressure of at least 1.15 millimeters, an oil holding capacity of at least 5.9 milliliters per gram, the web made by the process of:

(a) mixing a predetermined amount of chemical debonding agent which inhibits the formation of interfiber bonds into a pulp furnish;

(b) forming the pulp furnish and debonding agent mix into a web;

(c) pressing the web between a conventional wet press felt and a heated, moving creping surface to reduce the moisture content thereof and transfer the web to the creping surface;

(d) drying the web on the creping surface;

(e) simultaneously uniformly applying a predetermined amount of creping adhesive to the creping surface ahead of the position at which the web is applied to the moving creping surface;

(f) the amount of debonding agent mixed into the pulp furnish and the amount of creping adhesive applied to the creping surface selected such that substantial splitting apart of the web would occur if the web were pulled from the creping surface; and

(g) creping the dried web by removing the web from the creping surface with a creping blade having a cutting angle of about 72° or less such that crepes are formed on both sides of the web.

4,482,430

EXTENDED NIP PRESS LUBRICATING SYSTEM FOR A PAPER MACHINE

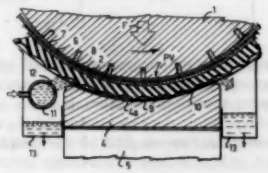
Pekka Majaniemi, Pirkkala, Finland, assignor to OY. Tampella AB, Tampere, Finland

Filed Mar. 14, 1983, Ser. No. 475,174

Claims priority, application Finland, Apr. 1, 1982, 821140

Int. Cl.³ D21F 3/02

U.S. Cl. 162—358 10 Claims



1. An extended nip press for a paper machine for removing water from a wet paper, cardboard or similar fibrous or porous web, said press comprising:

a rotating press roll,

at least one stationary loading shoe which is parallel with the axis of said press roll and together with said press roll forms an extended press zone,

a compressible band which is impermeable to a medium and passes through said press zone between said press roll and said loading shoe,

a sliding surface in said loading shoe which is pressed against said band from the opposite side with respect to said press roll,

at least one drying felt passing between said press roll and said band for passing a web to be dried through said press zone and for receiving water removed from said web, and

means for introducing a lubricating medium in between said band and said sliding surface of said loading shoe, the surface of said band facing said sliding surface of said loading shoe being provided with separated recesses for receiving the lubricating medium, said recesses being entirely closed by the sliding surface of said loading shoe when said recesses are within said press zone, and the press gap between said sliding surface and said press roll being tapered in a wedge shaped manner towards the outlet side of said sliding surface.

4,482,431

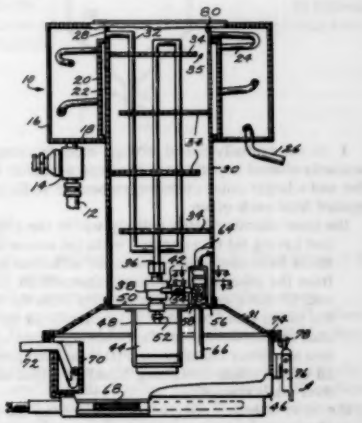
DISTILLATION APPARATUS WITH A LIQUID-VAPOR SEPARATING DEVICE HAVING THREE CHAMBERS

John L. Voorhees, 2504 Kimberly St., Silver Spring, Md. 20902

Filed Feb. 18, 1983, Ser. No. 467,922

Int. Cl.³ B01D 3/04

U.S. Cl. 202—176 11 Claims



1. A distillation apparatus comprising:

a first chamber having means for receiving a liquid to be distilled,

a second chamber having conduit means therein for receiving liquid from said first chamber and means for exposing said conduit means to heat for heating the liquid to a predetermined temperature, said conduit means having an outlet, said outlet being in flow communication with gas/liquid separating means, said gas/liquid separating means located in said second chamber having a first outlet for the liquid and a second outlet for gas,

said apparatus further including a third chamber with said first outlet of said separating means disposed to deliver liquid to said third chamber, said third chamber including heating means for heating liquid therein to a temperature sufficient to vaporize the liquid therein, said third chamber having a first opening leading to the interior of said second chamber so that the vapors derived from heating the liquid in said third chamber will pass into said second chamber and supply said heat to heat said conduit means and liquid contained therein, said second chamber having an outlet at an end thereof opposite to the end adjacent said first opening of said third chamber, said outlet of said

second chamber being connected to a condensing conduit which extends therefrom through said first chamber and having an end disposed exteriorly of said first chamber.

4,482,432

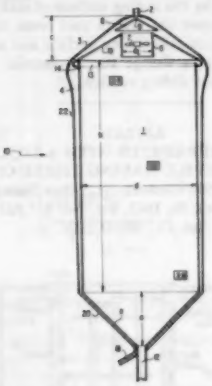
APPARATUS FOR SOLID/LIQUID SEPARATION BY VAPORIZATION AND CONDENSATION

Peter J. Caffes, Silver Spring, Md., assignor to The Caffes Trust (Irwin M. Aisenberg, Trustee), Washington, D.C.

Filed Dec. 23, 1981, Ser. No. 333,807

Int. Cl.³ B01D *1/24*; C02F *1/08*

U.S. Cl. 202—187 **10 Claims**



1. A substantially-closed hollow module comprising two similarly-shaped imperforate chambers, a smaller inner chamber and a larger outer chamber, respective walls of which are spaced from each other;

the inner chamber being entirely within the outer chamber and having (a) two opposed ends, (b) means to withdraw solids from one end, (c) means to withdraw gas or vapor from the other end, (d) means therewithin, at said other end, to move gas or vapor directly from the inner chamber to the outer chamber, (e) means, at or near the other end, to introduce a solids-containing liquid continuously into said inner chamber, and (f) means to spread virtually all of the solids-containing liquid as a thin sheet or film over walls thereof;

the outer chamber completely surrounding the entire inner chamber and having (a) two opposed ends, (b) means to receive gas or vapor directly from the inner chamber at one end, (c) means to condense vapor, (d) means to discharge non-condensed gas or vapor from the one end, (e) means to discharge condensed vapor from the other end, and (f) an externally-insulated outer wall.

4,482,433

PURIFICATION

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 30, 1982, Ser. No. 403,436

Int. Cl.³ B01D *1/22, 3/34*

U.S. Cl. 203—59 **6 Claims**

1. A process for separating N-organically substituted aminobenzaldehydes from a material containing N-organically substituted aminobenzaldehydes and higher boiling products of the reaction of preparing N-organically substituted aminobenzaldehydes, said process comprising the steps of adding N-organically substituted aniline stripping agent to said material, evaporating the material in the presence of sufficient added N-organically substituted aniline stripping agent to assist in the separation wherein the organic substitutents of the aniline compound are identical or next adjacent homologous to the organic substitutents of the aminobenzaldehyde product and the weight ratio of said aniline stripping agent to the crude N-organically substituted aminobenzaldehyde in the material is about 5:1 to about 1:5.

4,482,434

PROCESS FOR ELECTROCHEMICALLY ROUGHENING ALUMINUM FOR PRINTING PLATE SUPPORTS

Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,568

Claims priority, application Fed. Rep. of Germany, May 10, 1982, 3217552

Int. Cl.³ C25D *5/44, 5/00*; C25F *3/04*

U.S. Cl. 204—33 **19 Claims**

1. A process for producing a printing plate, comprising the steps of electrochemically roughening an aluminum or an aluminum alloy support in an aqueous electrolyte with an alternating current having a frequency in the range from about 1.5 to 10 Hz, and coating said roughened support with a radiation-sensitive reproduction coating.

4,482,435

PROCESS FOR PREPARING THIAZOLIDINE COMPOUNDS

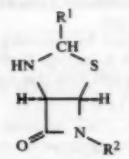
Sigeru Torii; Hideo Tanaka, and Takashi Shiroi, all of Okayama, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Aug. 9, 1982, Ser. No. 406,518

Int. Cl.³ C25B *3/00*

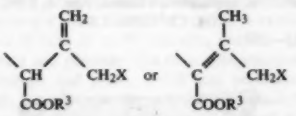
U.S. Cl. 209—73 R **16 Claims**

1. A process for preparing a thiazolidine compound represented by the formula

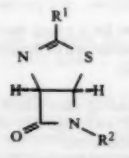


(I)

wherein R^1 represents a hydrogen atom, alkyl group, aralkyl group, aryl group or aryloxymethyl, R^2 represents a hydrogen atom or a group



wherein R^3 represents a hydrogen atom, alkyl group, halogenated alkyl group, benzyl group or silyl group, and X represents a hydrogen atom, halogen atom, hydroxy group, alkoxy group or acyloxy group, the process comprising electrolyzing a thiazoline compound represented by the formula



(II)

wherein R^1 and R^2 are as defined above, in a mixture comprising a perchloric acid aqueous solution and an organic solvent.

4,482,436

USE OF H_2SO_4 H_3PO_4 TO REMOVE ELECTROLYTIC DEPOSITS FROM SILVER CATHODE SURFACES

Charles K. Bon, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 10, 1983, Ser. No. 521,859

Int. Cl.³ C25B *3/04, 1/20*

U.S. Cl. 204—73 R **10 Claims**

1. An improvement in the method of removing base metal-containing deposits or occlusions from the surfaces of silver objects wherein the object is contacted with hydrochloric acid, said improvement comprising using sulfuric or phosphoric acid instead of the hydrochloric acid, thereby co-dissolving substantially less silver.

4,482,437

ELECTROCHEMICAL REDUCTIONS OF CYANOPYRIDINE BASES

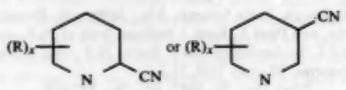
Joseph E. Toomey, Jr., Indianapolis, Ind., assignor to Reilly Tar & Chemical Corp., Indianapolis, Ind.

Filed Apr. 5, 1984, Ser. No. 597,013

Int. Cl.³ C25B *3/00*

U.S. Cl. 204—74 **9 Claims**

1. In a electrochemical reduction of a 2- or 3-cyanopyridine base having the formula



wherein:

x=0–2;

R=an alkyl group having about 1–6 carbon atoms, $-(CH_2)_n$-aryl where n=0–3, —CN, $-CO_2R'$ where R'=H or an alkyl, aryl or aralkyl group having about 1–10 carbon atoms, or —CONR"R"' where R" and R"' can be selected from the group consisting of H, an alkyl group having about 1–6 carbon atoms, and wherein R" and R"' taken together may be part of a heterocyclic ring, and wherein two adjacent R groups on the ring taken together may be a fused cycloalkyl or fused aryl group, the improvement comprising the step of conducting the electro-reduction reaction at a lead or alloyed lead cathode in a flow cell having an ion-exchange membrane divider, said conducting further being in an aqueous medium comprising sulfuric acid in at least a 1:1 mole ratio with the base in solution and further containing at least a catalytic amount of an iron salt.

4,482,438

METHOD OF PERFORMING A CHEMICAL REACTION

Roy E. Ballard, Norwich, and Alexander McKillop, Honingham, both of England, assignors to National Research Development Corporation, London, England

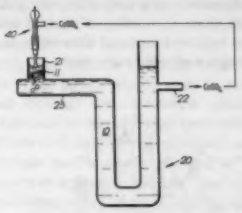
Filed Aug. 5, 1983, Ser. No. 520,646

Claims priority, application United Kingdom, Aug. 11, 1982, 8223071

Int. Cl.³ C25B *3/02*

U.S. Cl. 204—78 **20 Claims**

1. A method of performing a chemical reaction between a reactive species and a reactant, comprising flowing a liquid including the precursor of the reactive species past an electrode for forming the reactive species from its precursor, causing the liquid to flow out of the influence of the electrode and out of the influence of anything else that would react with the reactive species, and within 100 milliseconds contacting the liquid with a volume of liquid comprising the reactant, the two



liquids being substantially immiscible, whereby the reactive species reacts preferentially with the reactant.

4,482,439

ELECTROCHEMICAL OXIDATION OF PYRIDINE BASES

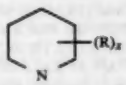
Joseph E. Toomey, Jr., Indianapolis, Ind., assignor to Reilly Tar & Chemical Corp., Indianapolis, Ind.

Filed Apr. 5, 1984, Ser. No. 597,014

Int. Cl.³ C25B *3/02*

U.S. Cl. 204—78 **16 Claims**

1. In an electrochemical oxidation of an alkylpyridine base having the formula



wherein:

x=1–3; and

R=$-CH_3$,

a primary or secondary alkyl group having about 2–6 carbon atoms,

a cycloalkyl group having about 3–6 carbon atoms,

an aralkyl group of the formula $[-(CH_2)_n$—aryl] where n=1–3, $-(CH_2)_mCOR'$ or $-(CH_2)_mCHOHR'$ where m=0–5 and R'=H, or

an alkyl group having about 1–6 carbon atoms, or a cycloalkyl, aryl or aralkyl group having about 3–10 carbon atoms, and wherein two adjacent R groups on the ring taken together may be a fused cycloalkyl or a fused aryl group,

the improvement comprising performing said oxidation in a flow cell having an ion-exchange membrane divider at a lead dioxide anode and in an aqueous medium comprising sulfuric acid in at least a 1:1 equivalent ratio with said alkylpyridine base in solution.

4,482,440

ELECTROCHEMICAL CELL AND PROCESS FOR MANUFACTURING TEMPERATURE SENSITIVE SOLUTIONS

Igor V. Kadija, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 6, 1983, Ser. No. 539,606

Int. Cl.³ C25C *1/00, 1/12, 7/00*

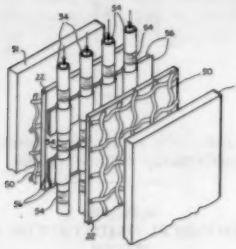
U.S. Cl. 204—105 R **23 Claims**

1. A process for regenerating a spent temperature sensitive solution, said process comprising:

providing an electrochemical cell having at least one chamber containing an electrode and at least one other chamber containing a counterelectrode and a counterelectrolyte;

supplying said spent solution to said at least one electrode chamber for use as an electrolyte;

maintaining the temperature of said electrolyte during solution regeneration within a desired temperature range to reduce the rate of decay of said temperature sensitive solution, said maintaining step comprising forming each said electrode from a plurality of spaced apart, substantially parallel hollow tubes and flowing a heat exchange medium through each said tube; and



distributing a substantially uniform current through said cell, said current distributing step comprising applying said current to a plurality of spaced apart, substantially parallel current collectors bonded to external surfaces of said tubes.

4,482,441

PERMEABLE DIAPHRAGM, MADE FROM A HYDROPHOBIC ORGANIC POLYMERIC MATERIAL, FOR A CELL FOR THE ELECTROLYSIS OF AQUEOUS SOLUTIONS OF AN ALKALI METAL HALIDE

Jean Indeherbergh, Rueil-Malmaison, France, and Edgard Nicolas, Meise-Eversem, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 248,221, Mar. 27, 1981, abandoned. This application Sep. 16, 1983, Ser. No. 533,641

Claims priority, application France, Mar. 27, 1980, 80 06919

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—128 **7 Claims**

1. A process of manufacturing chlorine and hydrogen gases which comprises placing in an electrolytic cell having an anode and cathode an aqueous solution of alkali metal chloride, positioning betweeen said anode and cathode a permeable diaphragm comprising a porous sheet of hydrophobic fluorinated organic polymeric material containing magnesium oxide in an amount equal to between 20% and 60% of the total weight of the sheet, said magnesium oxide being in the form of particles having a mean diameter at most equal to 0.5 microns freely dispersed throughout the polymeric material of the sheet and passing electric current through said solution and diaphragm between said cathode and anode to produce hydrogen at the cathode and chlorine at the anode.

4,482,442

PHOTOELECTROCHEMICAL ETCHING OF N-TYPE GALLIUM ARSENIDE

Paul A. Kohl, and Frederick W. Ostermayer, Jr., both of Chatham, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

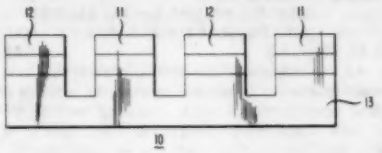
Continuation-in-part of Ser. No. 281,654, Jul. 9, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,993

Int. Cl.³ C25F *3/12, 3/14*

U.S. Cl. 204—129.3 **35 Claims**

1. A process for fabricating devices comprising at least one n-type III–V compound semiconductor in which the compound semiconductor comprises at least 50 mole percent gallium and the process comprises at least one step in which the n-type semiconductor compound is photoelectrochemically etched by an oxidation-reduction reaction in an electrolytic solution characterized in that

a. the oxidation is carried out by illuminating the n-type III–V compound semiconductor with radiation comprising photon energy at least as great as the band gap of the compound semiconductor so as to produce holes that permit oxidation of the compound semiconductor,



b. the electrolytic solution comprises one or more oxidizing agents with reduction potentials in the electrolytic solution between the potential of the conduction band minimum and the potential of the valence band maximum and with the total concentration of oxidizing agent between 0.1 molar and saturation, and

c. the oxidizing agent is reduced on a metallic or p-type surface electrically connected to the III–V compound semiconductor.

4,482,443

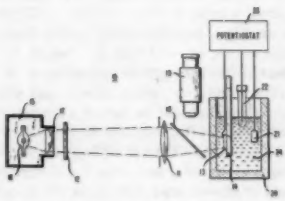
PHOTOELECTROCHEMICAL ETCHING OF N-TYPE SILICON

Duane E. Bacon, Lee's Summit, Mo.; Jeffrey R. Bessette, Piscataway, and Paul A. Kohl, Chatham, both of N.J., assignors to AT&T Technologies, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 30, 1983, Ser. No. 567,050

Int. Cl.³ C25F *3/12, 3/14*

U.S. Cl. 204—129.3 **12 Claims**



1. A process for fabricating a device comprising n-type silicon semiconductor comprising the step of etching at least part of the semiconductor characterized in that the etching procedure is an electrochemical photoetching procedure in which electric current is passed through the semiconductor, electrolytic solution with conductivity greater than 0.00001 mhos/cm and anode in which the electrochemical photoetching procedure further comprises:

a. applying a potential to the semiconductor which is between the maximum potential of the valence band of the semiconductor in the electrolytic solution and the minimum potential of the conduction band of the semiconductor in the electrolytic solution;

b. illuminating the part of the surface of the semiconductor to be etched with radiation of sufficient energy to produce holes in the valence band;

c. the electrolytic solution comprises solvents and fluoride ions, said solvents comprising alcohol with up to 10 carbon atoms, said solvent having less than 5 weight percent water.

4,482,444

PROCESS FOR ELECTROCHEMICALLY MODIFYING ELECTROCHEMICALLY ROUGHENED ALUMINUM SUPPORT MATERIALS AND THE USE OF THESE MATERIALS IN THE MANUFACTURE OF OFFSET PRINTING PLATES

Werner Frass, Wiesbaden, and Dieter Mohr, Römerberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 504,874

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3222967

Int. Cl.³ C25F *3/04;* **C25D** *11/16;* **B41N** *1/08;* **G03F** *7/02*

U.S. Cl. 204—129.35 **10 Claims**

1. A process for electrochemically modifying at least one surface of electrochemically roughened aluminum or aluminum alloy-based support materials for printing plates in an aqueous electrolyte, comprising the steps of:

(a) using alternating current to electrochemically roughen an aluminum or aluminum alloy-based support in an aqueous electrolyte containing at least one from the group consisting of hydrochloric acid and nitric acid, and

(b) after step (a), subjecting said support as a cathode to direct current in an aqueous electrolyte which has a pH value in the range of 3 to 11 and which consists essentially of at least one water-soluble salt selected from the group consisting of an alkali metal salt and an alkaline earth metal salt of:

(i) a hydrohalogenic acid,

(ii) an oxo-acid or halogen, carbon, boron, nitrogen or sulfur, or

(iii) a fluorine-containing acid of boron, silicon or sulfur, said water-soluble salt being present in a concentration ranging from about 5 g/l up to the saturation limit of said salt, so as to electrochemically remove from the surface of said support an amount of material ranging between about 0.1 and about 10 g/m^2.

4,482,445

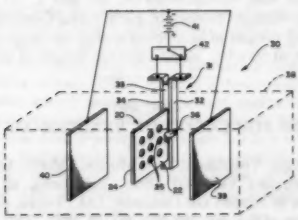
METHODS AND APPARATUS FOR ELECTROCHEMICALLY DEBURRING PERFORATE METALLIC CLAD DIELECTRIC LAMINATES

Joseph C. Fjelstad, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 22, 1982, Ser. No. 350,425

Int. Cl.³ C25F *3/14, 7/00*

U.S. Cl. 204—129.43 **64 Claims**



1. The method of deburring a perforate metallic clad dielectric laminate having: (i) a non-conductive dielectric lamination; (ii) at least one conductive metallic clad lamination in face-to-face contact with the non-conductive dielectric lamination; and (iii), at least one thru-hole perforation extending through each of the conductive and non-conductive laminations; comprising the steps of:

(a) immersing the laminate within a supply of electrolyte solution;

(b) coupling one conductive metallic clad lamination on the dielectric laminate at a time to the positive terminal of a power source to render the one conductive metallic clad lamination anodic;

(c) immersing cathode defining means in the supply of electrolyte solution with at least one cathode positioned on the side of the dielectric laminate opposite the one conductive anodic metallic clad lamination; and,

(d) coupling the cathode defining means to the negative terminal of the power supply so as to complete a conductive path through the electrolyte solution between the anodic conductive metallic clad lamination and the at least one cathode with such conductive path extending through the thru-hole perforation(s) defined by the non-conductive dielectric lamination and by the conductive metallic clad lamination in the metallic clad dielectric laminate so as to minimize current density and electrochemical attack in that region of the thru-hole perforation(s) defined by the non-conductive dielectric lamination and to concentrate current density and preferential electrochemical attack at the peripheral edge of the conductive anodic metallic clad lamination surrounding the thru-hole perforation(s).

4,482,446

ARTICLE AND METHOD OF ELECTRODEPOSITION OF AQUEOUS DISPERSIONS WITH FINELY-DIVIDED, NON-IONIC PLASTICS

Hans-Joachim Streitberger; Peter Lessmeister, both of Münster, and Norbert Zdahl, Ascheberg, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern A.G., Hamburg, Fed. Rep. of Germany

Division of Ser. No. 154,871, May 30, 1980, Pat. No. 4,361,660. This application Jul. 2, 1982, Ser. No. 394,678

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1979, 2923589

Int. Cl.³ C25D *13/00*

U.S. Cl. 204—181 C **14 Claims**

14. A process for the electrophoretic deposition of a cationic resin together with a finely-divided, non-ionic plastic from an aqueous dispersion onto an electrically conducting material, connected as the cathode, wherein the deposition is carried out at a pH value between 7 and 9, said aqueous dispersion consisting of an aqueous solution and/or aqueous dispersion of a reaction product, protonated with acids, from the reaction of (a) Mannich bases which are free from epoxide groups with (b) epoxide resins wherein aliphatic hydroxyl groups originating from (a), (b) or a mixture thereof are converted, at least partially, into urethane groups by reaction with partially blocked isocyanate, said Mannich bases (a) formed from components selected from the group consisting of:

(a_1) condensed phenols which are free from ether groups and contain at least two aromatic rings and at least two phenolic hydroxy groups;

(a_2) condensed phenols which contain ether groups and contain at least two aromatic rings and at least two phenolic hydroxyl groups;

(a_5) formaldehyde or compounds which split off formaldehyde; and

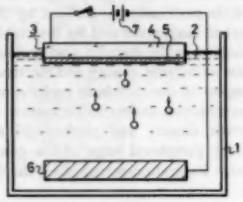
(a_3) secondary amines having at least one hydroxyalkyl group or a mixture of a_3 and

(a_4) secondary dialkylamines or dialkoxyalkylamines which do not contain free hydroxyl groups or from the components (a_1) or (a_2) with (a_5) and (a_3) or a mixture of (a_3) and (a_4), the improvement which comprises dispersed therein finely-divided, non-ionic plastics selected from the group consisting of epoxide resins, polyester resins, acrylate resins, polyurethane resins, polyamide resins, polyethylene, polypropylene, cellulose acetobutyrates and mixtures thereof.

4,482,447
NONAQUEOUS SUSPENSION FOR ELECTROPHORETIC DEPOSITION OF POWDERS

Jin Mizuguchi, Yokohama; Koichiro Sumi, Kouriyama; Tsuneo Muchi, Kawasaki, and Shinichi Soyama, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,739
Claims priority, application Japan, Sep. 14, 1982, 57-160252
Int. Cl.³ C25D *13/02, 13/10*
U.S. Cl. 204—181 N **8 Claims**

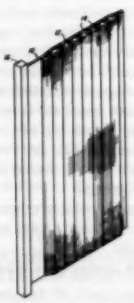


1. Nonaqueous suspension for electrophoretic deposition of powders comprising:
suspension consisting of ketonic solvent, nitrocellulose dissolved therein and powders suspended therein;
strong acid; and
strong base,
said strong acid and said strong base both being added to said suspension such that conductivity of said suspension becomes 1 to 30 μ /cm.

4,482,448
ELECTRODE STRUCTURE FOR ELECTROLYSER CELLS

Christopher T. Bowen, Pointe Claire; H. John Davis, Beaconsfield, and Rodney L. LeRoy, Pointe Claire, all of Canada, assignors to Noranda Inc. and The Electrolyser Corporation Ltd., both of Toronto, Canada

Filed Sep. 21, 1982, Ser. No. 420,637
Claims priority, application Canada, Dec. 23, 1981, 393109
Int. Cl.³ C25B *11/03*
U.S. Cl. 204—284 **5 Claims**

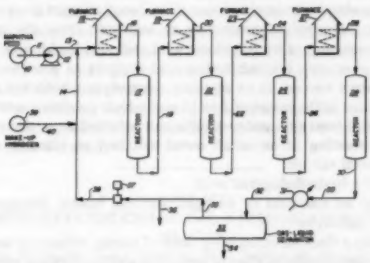


1. An electrode structure for unipolar electrolytic cells comprising:
(a) a formed metal plate current-collector structure having vertically orientated corrugations which define a plurality of respective crests and adapted to be placed vertically in the electrolytic cell;
(b) a porous electrode secured to the crests of said corrugations on at least one side thereof so as to form an essentially-planar pre-electrode surface, the depth of said corrugations being such as to allow an unimpeded vertical rise of evolved gases to the top of the electrode between the corrugated plate and the pre-electrode surface; and
(c) means for removing or applying current from one vertical end edge of said plate.

4,482,449
REFORMING WITH A CATALYST CONTAINING A GROUP VIII NOBLE METAL, A GROUP VIII NON-NOBLE METAL, AND GALLIUM ON SEPARATE SUPPORT PARTICLES

Cecelia M. Sorrentino, Naperville, Ill.; Regis J. Pellet, Croton-On-Hudson, N.Y., and Ralph J. Bertolacini, Naperville, Ill., assignors to Standard Oil Company (Indiana)

Division of Ser. No. 533,145, Sep. 16, 1983,. This application Mar. 30, 1984, Ser. No. 595,278
Int. Cl.³ C10G *35/085*
U.S. Cl. 208—139 **11 Claims**



1. A process for the conversion of a hydrocarbon stream, which process comprises contacting said stream under hydrocarbon conversion conditions and in the presence of hydrogen with a catalyst comprising a physical particle-form mixture of a Component A, a Component B, and a Component C, said Component A comprising at least one Group VIII noble metal deposed on a solid catalyst support material providing acidic catalytic sites, said Component B comprising a non-noble metal of Group VIII selected from cobalt, nickel, and mixtures thereof deposed on a solid catalyst support material providing acidic catalytic sites, and said Component C comprising a small amount of gallium deposed on a solid catalyst support material providing acidic catalytic sites, said catalyst having been prepared by thoroughly and intimately blending finely-divided particles of said Components A, B, and C to provide a thoroughly-blended composite, each of said Components A, B, and C being present in an amount within the range of about 25 wt% to about 50 wt%, based upon the weight of said catalyst.

4,482,450
PROCESS FOR CATALYTIC REACTION OF HEAVY OILS

Masaru Ushio, Yokohama; Toru Morita; Takeshi Ishii, both of Kawasaki, and Yasuyuki Oishi, Yokohama, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 288,363, Jul. 30, 1981,. This application Oct. 3, 1983, Ser. No. 538,361
Claims priority, application Japan, Jul. 31, 1980, 55/104293
Int. Cl.³ C10G *45/14;* **B03C** *1/02*
U.S. Cl. 208—152 **4 Claims**

1. In a process for hydrodesulfurization of heavy oils which comprises reacting said oils with a dehydrosulfurization catalyst under a hydrogen pressure of 60 to 150 kg/cm² and at a temperature ranging 370° to 450° C., the improvement which comprises withdrawing a part or the whole of the spent catalyst particles from a reactor, feeding the withdrawn catalyst particles by using water as a carrier fluid at a linear velocity of 0.01 to 10,000 meters/hour in a particle connection of 0.1 to

1000 g/liter to a high gradient magnetic separator which is so designed that a ferromagnetic matrix is placed in a uniform high magnetic field, thereby separating the withdrawn catalyst particles into (a) the particles which have been rendered magnetic by the deposition thereon of nickel, vanadium, iron and copper originally contained in the heavy oils, and (b) non-magnetic particles, and returning the non-magnetic particles to the reactor for re-use.

4,482,451

PROCESS FOR THE SEPARATION OF PARTICULATE SOLIDS FROM VAPORS USING A DISCHARGE HAVING A HELICAL TWIST

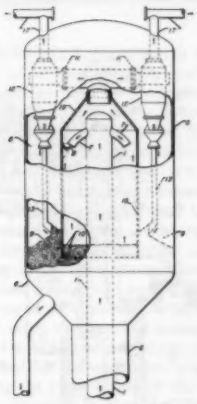
Thomas L. Kemp, Elmhurst, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 418,954, Sep. 16, 1982, Pat. No. 4,397,738. This application Apr. 25, 1983, Ser. No. 488,229

The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.

Int. Cl.[3] C10G *11/18*; F27B *15/00*

U.S. Cl. 208—161 **9 Claims**



1. A process for separating particulate solids from a stream comprising vapors and particulate solids passed in admixture through a vertically elongated contacting zone, which process comprises discharging said stream from said contacting zone downwardly into the main body of a disengagement zone, said disengagement zone having an interior cylindrical surface, the cylindrical axis of which is substantially vertical, altering the direction of flow of said stream upon the discharge of said stream from said contacting zone by deflection means so as to effect the flow of said stream to be in a downward direction along the curvature of said interior surface, said stream having a downward progression while maintaining a helical twist about a vertical axis, whereby said solids fall to a bottom portion of said disengagement zone and said vapors rise to an upper portion thereof, the angle of direction of flow of said stream from said deflection means to the horizontal being greater than 0° and less than 45°.

6. An apparatus useful for separating particulate solids from a stream comprising vapors and particulate solids in admixture, said apparatus comprising in combination:

(a) a vertical riser conduit having a discharge opening through which said stream may pass;

(b) a cylindrical vessel containing said discharge opening, the cylindrical axis of said vessel being vertical and said opening discharging into the main body of the vessel; and,

(c) a deflecting means comprising a curved surface juxtaposed with respect to said discharge opening such that said stream passing from said discharge opening is deflected in a downward direction along the curvature of the interior surface of said vessel, and wherein the angle of direction of flow of said stream from said deflecting means to the horizontal is greater than 0° and less than 45°, said deflecting means providing a downward progression to said stream while maintaining a helical twist about a vertical axis.

4,482,452

PROCESS FOR PREPARING RAW MATERIAL FOR PRODUCING CARBON MATERIAL

Masatomo Shigeta; Yosio Isii, and Akio Hoshi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Sumitomo Metal Industries, Limited, Osaka, both of, Japan

Filed May 19, 1982, Ser. No. 379,881

Claims priority, application Japan, May 29, 1981, 56-83598

Int. Cl.[3] C10G *21/12, 29/02*

U.S. Cl. 208—177 **8 Claims**

1. A process for preparing heavy oil containing less than 300 ppm of quinoline-insoluble, minute solid impurities as a raw material for carbon materials, comprising the steps of:

admixing (1) an organic solvent having a boiling point lower than 150° C., as a viscosity-controlling agent, and (2) a surfactant soluble in heavy oil of coal origin or petroleum origin in an amount of 0.1 to 10% by weight of the heavy oil, with (3) a heavy oil of coal origin or petroleum origin;

stirring gently the resultant admixture at a net motive power for mixing of 0.5 to 50 w/m^3 of the admixture;

subjecting the thus stirred admixture to centrifugal separation thereby separating the admixture into solid impurities and an oily liquid; and

distilling, repsectively, the thus separated oily liquid to remove light fraction from the oily liquid to obtain the heavy oil as a raw material for carbon materials and the solid impurities to recover light fraction therefrom;

wherein said surfactant is a de-foamant selected from the group consisting of anionic surfactants, cationic surfactants and non-ionic surfactants.

4,482,453

SUPERCRITICAL EXTRACTION PROCESS

Daniel M. Coombs, and Gary P. Willers, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1982, Ser. No. 408,964

Int. Cl.[3] C10C *3/08, 1/18*; C10G *21/00*

U.S. Cl. 208—309 **20 Claims**

1. A process for the recovery of extract oils from a high metals content carbonaceous feed which comrpises the steps of:

(1) contacting said feed with a solvent in a first separation zone comprising an extraction vessel under supercritical conditions for said solvent in which zone the separation of said feed into a light phase and a heavy phase is effected;

(2) passing said heavy phase from step (1) to a first stripper where said stripper's light phase, containing solvent, is recovered for reuse and said stripper's heavy phase, containing asphalt product, is divided into two portions, with one portion being recycled to said first separation zone and the other portion being recovered as asphalt product; and

(3) passing said light phase from step (1) to a second separation zone wherein a second light phase, containing solvent, is produced and is recycled to said first separation zone, and a heavy phase, produced from said second separation zone, is passed to a second stripper for recovery of said second stripper's extract product containing heavy phase and said second stripper's solvent containing light phase, which is reused.

4,482,454

PROCESS FOR TREATING CASSITERITE ORE

Jacques DeCuyper, Sterrebeek; Edwin Broekaert, Brussels, both of Belgium, and Joris Van't Hoff, Puteaux, France, assignors to Ceca S.A., France

Filed Nov. 9, 1982, Ser. No. 440,292
Claims priority, application France, Nov. 9, 1981, 81 20966
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—166 **5 Claims**

1. A process for the preliminary flotation of a cassiterite ore in order to recover impurities selected from the group consisting of silicates, silicoaluminates, fluorite, iron oxides and carbonates in the float and provide an improvement in selectivity in the course of subsequent concentrations of said ore by anionic flotation, comprising the step of effecting flotation by means of an amphoteric collector of the formula:

$$R—(NH—CH_2—CH_2)_n—NH—CH_2—CH_2—COOH$$

in which:

R is $CH_3—(CH_2)_{m-1}$ or $CH_3—(CH_2)_{m-1}$ $OCH_2CH_2CH_2$—,

m is 12 to 22, and

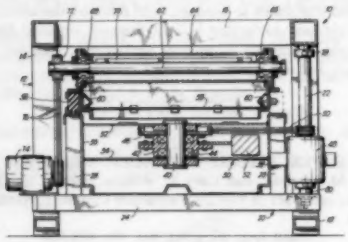
n is 0, 1, 2, or 3.

4,482,455

DUAL FREQUENCY VIBRATORY SCREEN FOR CLASSIFYING GRANULAR MATERIAL

Cecil T. Humphrey, 5589 Regent St., Burnaby, B.C., Canada (V5B 4R6)

Filed Apr. 9, 1982, Ser. No. 367,122
Claims priority, application Canada, Oct. 16, 1981, 388058
Int. Cl.³ B07B *1/28*
U.S. Cl. 209—319 **8 Claims**



1. A vibration screen apparatus for classifying granular material comprising:

an outer frame;

an inner frame;

a screen deck;

resilient means mounting said screen deck on said inner frame;

means suspending the inner frame and screen deck from the outer frame;

means for vibrating said screen deck at a high frequency in a generally vertical plane; and

means for applying a lower frequency motion to said inner frame and said screen deck in a generally horizontal plane.

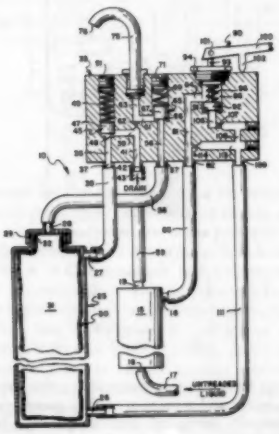
4,482,456

REVERSE OSMOSIS LIQUID TREATING APPARATUS

John R. Grayson, Inverness, Ill., assignor to RainSoft Water Conditioning Company, Elk Grove Village, Ill.

Filed Sep. 13, 1982, Ser. No. 416,953
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—134 **7 Claims**

1. Reverse osmosis liquid treating apparatus, comprising: a multiple purpose tank having a treated liquid inlet-outlet port and an effluent-untreated liquid inlet port and an effluent-untreated liquid outlet port connected to a drain; a flexible liquid-proof liner in said tank connected to said treated liquid inlet-outlet port of said tank to form a variable volume container for treated liquid free of connection to said tank along most of the surface thereof; automatic valve means intermediate said effluent-untreated liquid outlet port of said tank and said drain for controlling the flow of effluent-untreated liquid to the drain and the pressure of effluent-untreated liquid in said tank on said liner and said variable volume container formed thereby; a reverse osmosis module having an untreated liquid inlet port for connection to a pressurized source of untreated liquid and an effluent-untreated liquid outlet port connected to the untreated liquid inlet port of said tank and a treated liquid outlet port connected to said treated liquid inlet-outlet port of said tank to discharge treated liquid to the interior of said tank; and a manually actuated control valve intermediate said effluent-untreated liquid outlet port of said module and said effluent-untreated liquid inlet port of said tank for controlling the

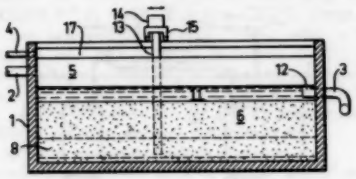


flow of effluent-untreated liquid to said tank, said control valve at steady-state conditions permitting a controlled amount of effluent to flow to said tank and thence to said drain such that the flow of effluent into said tank is substantially equal to the flow of effluent to said drain whereby treated liquid can accumulate in said variable volume container to the full volume thereof, the treated liquid in said varible volume container being cooled as effluent contacts most of the surface of said container and flows through said tank to said drain, actuation of said manually actuated control valve causing pressurized untreated liquid to flow through said module and into said tank at a flow rate in excess of the steady-state flow rate thereby increasing the pressure on said variable volume container in said tank to reduce the volume thereof thereby discharging treated liquid therefrom through the inlet-outlet port of said tank while simultaneously directing untreated liquid from said module to said drain to effect fast flushing of said module to enhance the treating action of said module and prolong module life.

4,482,457
FILTERING APPARATUS

Sten F. Jacquet, Hägersten, Sweden, assignor to Carex Process AB, Hagersten, Sweden

PCT No. PCT/SE82/00261, § 371 Date Apr. 4, 1983, § 102(e) Date Apr. 4, 1983, PCT Pub. No. WO83/00637, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 16, 1982, Ser. No. 491,195
Claims priority, application Sweden, Aug. 17, 1981, 8104869
Int. Cl.³ B01D 23/24
U.S. Cl. 210—270 7 Claims



1. An apparatus for filtering a suspension or emulsion, comprising an elongated bed of particulate filter material arranged in a container, one or more inlets for the suspension or emulsion to be filtered, arranged at the lower part of said bed and extending downward through the bed of the filter material so as to allow the suspension or emulsion to be filtered to flow in countercurrent to the filter material, means for the removal of filtrate, arranged above said bed, elevator means for conveying filter medium contaminated by the filtration from the lower part of the bed to means for washing or other treatment of the filter medium, said elevator means including an inlet conduit for air so as to transport the contaminated filter medium upwards, scraping means arranged to scrape along the upper surface of the filter bed at the same time as the movable elevator means is moved along the bed, and means for recycling treated filter medium to the upper part of the bed, wherein an elongated inlet channel for the suspension or emulsion to be filtered extends along the entire length of the container with said elevator means provided in the inlet channel, and the means for conveying the contaminated filter medium is arranged movably along the horizontal extent of the filter bed.

4,482,458
PROCESS AND APPARATUS FOR THE ANAEROBIC TREATMENT OF WASTE WATER IN A FILTER INCLUDING GRANULAR MATERIAL

Jean-Marie Rovel, Rueil-Malmaison; Claude Prévot, Ville D'Avray, and Roger Nicol, Vanves, all of France, assignors to Degremont, Hauts de Seine, France

Filed Sep. 22, 1983, Ser. No. 534,621
Claims priority, application France, Sep. 28, 1982, 82 16273
Int. Cl.³ C02F 3/28; C12M 1/08
U.S. Cl. 210—603 8 Claims

1. A process for the anaerobic treatment of waste water, during which treatment there is formed biogas, said process comprising:

providing an enclosure having therein a filter including granular material having a density greater than that of the waste water to be treated;

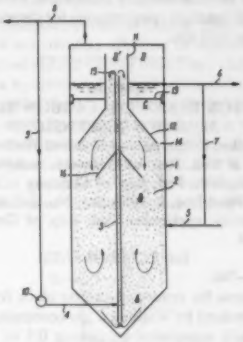
introducing waste water to be treated into said enclosure, whereby said water circulates upwardly through said filter during an anaerobic treatment resulting in formation of biomass which is supported by said granular material and resulting in formation of said biogas;

collecting said biogas at an upper portion of said enclosure above said filter and said waste water to be treated;

providing at least one tube extending vertically upwardly through said filter;

withdrawing said collected biogas and compressing at least a portion thereof;

injecting into said tube said compressed biogas, thereby creating a pumping action upwardly through said tube, and thereby continuously circulating said waste water being treated and said granular material supporting said biomass upwardly through said tube and downwardly through a turbulence zone exteriorly of said tube, said



anaerobic treatment substantially occurring in said turbulence zone;

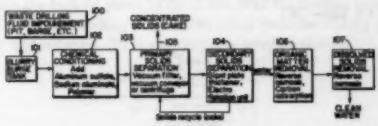
decanting and removing treated water from said enclosure at a position above said turbulence zone; and

regulating the rate of said circulation of said granular material and said waste water by controlling the flow of said compressed biogas as a function of the difference in densities between said granular material supporting said biomass and said water being treated.

4,482,459
CONTINUOUS PROCESS FOR THE RECLAMATION OF WASTE DRILLING FLUIDS

Carolyn Shiver, Church Point, La., assignor to Newpark Waste Treatment Systems Inc., Metairie, La.

Filed Apr. 27, 1983, Ser. No. 489,127
Int. Cl.³ C02F 1/44, 1/56
U.S. Cl. 210—639 10 Claims



1. The method of rendering a waste drilling fluid slurry from oil wells containing cuttings, formation fluid solids and liquids and the like, safe for environmental discharge both in a liquid and solid cake state comprising the steps of

(a) conducting the uphole drilling fluids to a continuous flow process having a slurry surge tank for chemical conditioning by addition of an inorganic acidic coagulant permitting settling and thickening,

(b) subjecting the thickened mud slurry under flow from step (a) thereafter to a primary solids separation unit where an organic flocculant of the group of polyacrylamides is added to aid flocculation of the solids and from which solids of less than 50% moisture content and water are produced,

(c) subjecting the water from (b) to a secondary solids removal unit, chemically conditioning and reintroducing the solids recovered back to the primary solids separation unit,

(d) subjecting the water obtained from the secondary solids removal step (a) to a chemical oxygen demand reduction unit having a carbon adsorption unit for removal of organic substances or a reverse osmosis unit for removal of organic substances and dissolved solids including chlorine compounds to meet environmental discharge requirements,

(e) removing the treated primary solids from step (b) consisting of an environmentally compatible cake meeting environmental leachate requirements for disposal as landfill on or off the drill site.

4,482,460

PROCESS FOR REMOVING CARBON BLACK FROM AQUEOUS SUSPENSIONS

Joachim Kandler, Erftstadt, and Manfred Wolter, Hürth-Knapsack, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 213,868

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949286

Int. Cl.³ C01B *31/02*

U.S. Cl. 210—706 **8 Claims**

1. In a process for removing carbon black from an aqueous suspension obtained by washing a gas containing carbon black with water, said suspension containing 0.5 to 4% by weight solid matter, introducing into said suspension while stirring a gas stream comprising hydrocarbons and at least one inert gas at temperatures of 10° to 80° C. with the resultant formation of a hydrocarbon-containing carbon black agglomerate on the surface of the water, and separating the carbon black agglomerate from the water, the improvement according to which the gas stream is prepared by passing gas consisting essentially of one or more inert gases over the carbon black agglomerate which has been separated from the water, and heated to temperatures of 200° to 400° C.

4,482,461

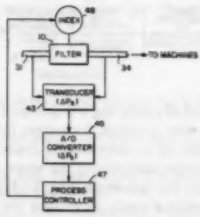
BACKWASH CONTROL FOR CONSTANT VOLUME-PRESSURE FILTRATION SYSTEM

David B. Hindman, Rochester; Norman E. Wood, Pittsford; David N. Foster, Rochester; D. Stephans Damtoft, Jr., and James S. Paduchowski, both of Rochester, all of N.Y., assignors to French Systems, Inc., Rochester, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,086

Int. Cl.³ B01D *23/24, 37/00*

U.S. Cl. 210—741 **20 Claims**



1. A method of improving the filtering of fluids in a system of the type having a filter connected in a system line to filter fluid flowing through the line, comprising the steps of

monitoring differential fluid pressure across said filter,

automatically and intermittently cleaning said filter each time a value of said differential pressure thereacross reaches a preset value, and

automatically adjusting said preset value during intervals between said cleaning steps each time the value of said differential pressure across said filter for a given instant in one of said intervals differs from that for the corresponding instant in the preceding interval.

4,482,462

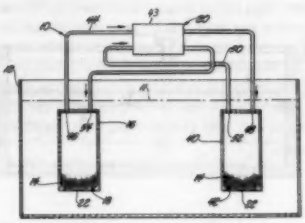
MECHANICAL DEVICES FOR CHEMICAL TREATMENT OF FLUIDS

Steven M. Johnson, Dexter, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jan. 10, 1983, Ser. No. 456,909

Int. Cl.³ C02B *1/18*

U.S. Cl. 210—752 **23 Claims**



10. A process fluid chamber comprising: a reservoir (12) for containing a predetermined amount of a process fluid (11) and a device (10) adapted to be at least partially disposed within said process fluid (11) for treating the process fluid (11) with a solid chemical reactant (14), said device (10) including a first compartment (16) for containing the chemical reactant (14) and a first port (18) for allowing flow of the process fluid (11) into and out of said first compartment (16) and characterized by recirculation means (20) at least partially located externally of said first compartment (16) at a second end portion substantially opposite said one end portion and said first port (18) for cycling the process fluid (11) through said first compartment (16) by alternately drawing only a portion of the process fluid (11) into said first compartment (16) through said first port (18) to bring the portion of the process fluid (11) into direct contact with the chemical reactant (14) and treat a portion of the chemical reactant (14) with the portion of the process fluid (11) and then forcing the portion of the process fluid (11) out of said first compartment (16) through said first port (18) out of said first compartment (16) through said first port (18) to circulate the chemical reactant (14) in the treated portion of the process fluid (11) throughout the remaining process fluid (11) within the reservoir (12).

4,482,463

LUBRICANT COMPOSITIONS CONTAINING NITROGEN-CONTAINING POLYSULFIDE LOAD-CARRYING ADDITIVES

Henri Dubas, Ettingen, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 23, 1982, Ser. No. 422,329

Claims priority, application Switzerland, Oct. 6, 1981, 6416/81

Int. Cl.³ C10M *1/38*

U.S. Cl. 252—47.5 **11 Claims**

1. A lubricant composition which comprises

(a) a mineral oil, a synthetic oil or mixture thereof, and

(b) 0.001 to 5% by weight, based on the lubricant, of one or more compounds of formula I

$$A-(S)_n-G \quad (I)$$

wherein n is an integer from 2 to 6, and

A and G are the same or different and represent

wherein R_1 and R_2 are the same or different and are C_1–C_{24} alkyl, C_3–C_{18} alkenyl, C_3–C_{12} cycloalkyl, aryl containing 6 to 10 carbon atoms in the nucleus, C_7–C_{30} aralkyl, or said alkyl, said alkenyl, said cycloalkyl, said aryl or said aralkyl substituted by —Cl, by —ZR^5, by —ZCN, by —NCZ, by CZZ^1R^5, by —ZCZ^1R^5, by —$CZNR^7R^8$, by —NR^7R^8 or by —CZZ^1E, where Z and Z^1 are independently —O—, —S—, —S_2, —SO—, —SO_2— or —SO_3—, R^5 is hydrogen, C_1–C_{18} alkyl, C_3–C_{18} alkenyl, or said alky or said alkenyl substituted by —Cl, by —ZCN, by —NCZ or by —CN, and E is Na, K or —$NR^7R^8R^9$ where R^7, R^8 and R^9 are the same or different and have the same definition as R^5.

7. A lubricant composition which comprises

(a) a mineral oil, a synthetic oil or mixture thereof, and

(b) 0.001 to 5% by weight, based on the lubricant, of one or more compounds of formula I

(I)

wherein n is an integer from 2 to 6, and represents

wherein R^1 and R^2 are the same or different and are C_1–C_{24} alkyl, C_3–C_{18} alkenyl, C_{3-C12} cycloalkyl, aryl containing 6 to 10 carbon atoms in the nucleus, C_7–C_{30} aralkyl, or said alkyl, said alkenyl, said cycloalky, said aryl or said aralkyl substituted by —Cl, by —ZR^5, by —ZCN, by —NCZ, by CZZ^1R^5, by —ZCZ^1R^5, by —$CZNR^7R^8$, by —NR^7R^8 or by —CZZ^1E, where Z and Z^1 are independently —O—, —S—, —S_2—, —SO—, —SO_2— or —SO_3—, R^5 is hydrogen, C_1–C_{18} alkyl, C_3–C_{18} alkenyl, or said alkyl or said alkenyl substituted by —Cl, by —ZCN, by —NCZ or by —CN, and E is Na, K or —$NR^7R^8R^9$ where R^7, R^8 , and R^9 are the same or different and have the same definition as R^5, and

G represents morpholino, piperazino, piperidino, pyrrolidino, hexamethyleneimino, imidazolidino or pyrrolo.

4,482,464

HYDROCARBYL-SUBSTITUTED MONO- AND BIS-SUCCINIMIDE HAVING POLYAMINE CHAIN LINKED HYDROXYACYL RADICALS AND MINERAL OIL COMPOSITIONS CONTAINING SAME

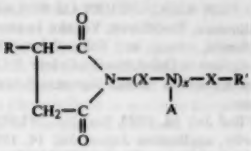
Thomas J. Karol, Wappingers Falls; Raymond C. Schlicht, Fishkill, and Harold S. Magaha, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 14, 1983, Ser. No. 465,941

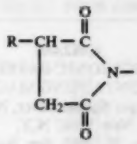
Int. Cl.³ C10M *1/36*

U.S. Cl. 252—51.5 A **17 Claims**

1. A hydrocarbyl-substituted mono- and bis-succinimide having polyamine chain linked hydroxyacyl radicals represented by the formula:



in which R is a hydrocarbyl radical having from about 8 to 400 carbon atoms, X is a divalent alkylene or secondary hydroxy substituted alkylene radical having from 2 to 3 carbon atoms, A is hydrogen or a hydroxyacyl radical selected from the group consisting of glycolyl, lactyl, 2-hydroxy-methyl propionyl and 2,2′-bis-hydroxymethyl propionyl radicals and in which at least 30 percent of said radicals represented by A are said hydroxyacyl radicals, x is a number from 1 to 6, and R′ is a radical selected from the group consisting of —NH_2,—NHA, or a hydrocarbyl substituted succinyl radical having the formula:



in which R and A have the values noted above.

4,482,465

HYDROCARBON-HALOCARBON REFRIGERANT BLENDS

Roy A. Gray, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 7, 1983, Ser. No. 472,688

Int. Cl.³ C09K *5/04*

U.S. Cl. 252—67 **26 Claims**

1. A refrigeration process comprising employing as a refrigerant the composition comprising:

(a) a first hydrocarbon,

(b) a first halocarbon, and

(c) a second hydrocarbon;

wherein the boiling point of (a) is less than the boiling point of (b); wherein the boiling point of (b) is less than the boiling point of (c); and wherein (b) is substantially nonflammable.

4,482,466

HEAT PUMPING PROCESS BASED ON THE PRINCIPLE OF ABSORPTION

Mats Westermark, Hörnåkersvägen 45, S-183 65 Täby, Sweden

Filed Oct. 20, 1982, Ser. No. 435,584

Claims priority, application Sweden, Oct. 20, 1981, 8106195

Int. Cl.³ C09K *5/00*; **F25B** *29/00, 15/02*

U.S. Cl. 252—69 **11 Claims**

1. An absorption heat-pumping process in a closed system which comprises:

(a) evaporating water at reduced pressure;

(b) absorbing heat in a phosphoric acid absorption medium at a first temperature and first pressure in the form of said water evaporated at reduced pressure from (a); and,

(c) subsequently evaporating water from the phosphoric acid medium at a higher pressure than said first pressure and at a higher temperature than said first temperature to thereby convert low temperature heat to heat of a higher temperature.

4,482,467

LIQUID FOR ABSORPTION OF SOLAR HEAT

Tadamitsu Nakamura, Yoshikawa; Yogaku Iwamoto, Hiratsuka; Kanichi Kadotani, Atsugi, and Tokuo Marui, Kawaguchi, all of Japan, assignors to Dainichiseika Colour & Chemicals Mfg. Co., Ltd. and Kabushiki Kaisha Komatsu Seisakusho, both of Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 397,983

Claims priority, application Japan, Jul. 14, 1981, 56-108854; Apr. 7, 1982, 57-56629; Apr. 7, 1982, 57-56630

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—70 **13 Claims**

1. A liquid for the absorption of solar heat, which comprises:

(a) a dispersing medium selected from the group consisting of propylene glycol, mixture of propylene glycol with water, mixture of propylene glycol with water and glycerin, and mixture of glycerin with water,

(b) a dispersant selected from the group consisting of polyvinylpyrrolidone, caramel, and mixture of polyvinylpyrrolidone with caramel, and

(c) a powdered activated carbon as a black coloring material.

4,482,468

POWDERED NONIONIC-BASED DETERGENT COMPOSITIONS CONTAINING MAGNESIUM SULFATE

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 28, 1983, Ser. No. 555,776

Int. Cl.³ C11D *1/66, 3/02*

U.S. Cl. 252—133 **8 Claims**

1. A particulate non-phosphate detergent composition comprising a nonionic detergent active compound or compounds which further comprises in intimate admixture therewith an effective amount of magnesium sulfate heptahydrate to substantially arrest and/or inhibit nonionic bleeding from said detergent composition.

4,482,469

CLEANING AGENT FOR FIRE-ARM BARRELS

Bodo Plötze, Amselweg 7, 8011 Vaterstetten, Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 414,665

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3135153

Int. Cl.³ C11D *3/26, 7/32*

U.S. Cl. 252—155 **9 Claims**

1. Cleaning agent for fire-arm barrels based on ammonia, in particular for the removal of abraded shot or bullet material, characterized in that, the ammonia is contained in a high viscosity gel containing potassium hydroxide and a dye.

4,482,470

VISCOSITY MODIFIERS FOR CONCENTRATED SURFACTANTS

Herbert Reuter, Hilden; Lothar Pioch, Düsseldorf; Karl-Heinz Schmid, Mettmann, and Wolfgang Seiter, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 6, 1982, Ser. No. 395,588

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151679

Int. Cl.³ C11D *1/02, 1/83*

U.S. Cl. 252—162 **11 Claims**

1. A process for the manufacture of powdery or granular spray dried detergents and cleaners comprising the steps of:

I. forming an aqueous anionic surfactant concentrate having a viscosity of 10,000 CPS or less at a temperature in the range of 50° to 90° C. comprising

A. an anionic surfactant component which is either

(a) at least about 33 wt. %, based on the weight of the concentrate, of an alkali metal salt of an α-sulfo fatty acid ester or an alkali metal salt of an alkyl sulfate, or

(b) at least about 53 wt. %, based on the weight of the concentrate, of an alkali metal salt of an alkyl aryl sulfonate; and

B. from about 0.1 to about 10% by weight of the concentrate of at least one viscosity modifier selected from the group consisting of:

(a) a polyethylene glycol having a molecular weight of from about 600 to about 6000;

(b) a polypropylene glycol having a molecular weight of from about 250 to about 4000;

(c) an adduct of from about 20 to about 80 moles of ethylene oxide with an aliphatic alcohol having from 10 to 20 carbon atoms; and

(d) an adduct of from about 20 to about 60 moles of ethylene oxide with an alkyl phenol having from 6 to 12 carbon atoms in the alkyl group; and

wherein the aqueous anionic surfactant concentrate in the absence of component B. has a viscosity of more than 10,000 CPS at a temperature in the range of 50°-90° C.; and

II. processing the concentrate formed in I. above at a temperature in the range of from about 50° C. to about 90° C.

4,482,471

SILICONATE-COATED SODIUM PERBORATE

Edwin Allen, Oupeye; Alan Dillarstone, Rocourt, and Joseph A. Reul, Heusy, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 366,713, Apr. 8, 1982, Pat. No. 4,421,657. This application Nov. 21, 1983, Ser. No. 554,049

Int. Cl.³ C09K *3/18;* **C11D** *3/20, 3/395, 17/06*

U.S. Cl. 252—186.31 **2 Claims**

1. Particles of sodium perborate of sizes in the range of No's. 10 to 200, U.S. Sieve Series, at least partially coated with a salt of a lower alkyl siliconic acid and/or polymerization product(s) thereof formed therefrom on storage.

2. Sodium perborate particles according to claim 1 which are coated with from 0.05 to 1% of potassium methyl siliconate.

4,482,472

LIQUID CRYSTAL MATERIALS

Neil Carr, Hull; Jennifer Constant, Powick; George W. Gray, Cottingham; Damien G. McDonnell, and Edward P. Raynes, both of Malvern, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, England

Filed Aug. 2, 1982, Ser. No. 404,497

Claims priority, application United Kingdom, Aug. 6, 1981, 8124044; Aug. 6, 1981, 8124045; Jun. 15, 1982, 8217356

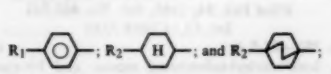
Int. Cl.³ C02F *1/13;* **C09K** *3/34*

U.S. Cl. 252—299.1 **23 Claims**

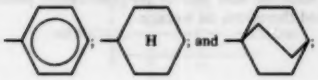
1. A liquid crystal material which comprises a mixture of compounds at least one of which is a low viscosity additive compound wherein the improvement comprises in said low viscosity additive compound being a compound of Formula (I) as follows:

$$A—CH_2.CH_2—B \qquad \text{Formula (I)}$$

wherein A is selected from:



and B is selected from:



where

R_1 is selected from alkyl, alkoxy, alkylcarbonyloxy, and alkoxycarbonyloxy; and

R_2 is alkyl;

and where

is a benzene ring;

is a cyclohexane ring, which is in the trans-configuration if di-substituted; and

is a bicyclo(2,2,2)octane ring.

4,482,473

LIQUID CRYSTAL MIXTURE

Fumiaki Yamanashi; Yuzo Hayashi, and Yoshiyuki Fujiwara, all of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Japan

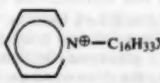
Filed Sep. 30, 1982, Ser. No. 431,178

Claims priority, application Japan, Oct. 30, 1981, 56-174134

Int. Cl.³ G02F *1/13*; C09K *3/34*

U.S. Cl. 252—299.1 **3 Claims**

1. A liquid crystal mixture comprising a nematic liquid crystal having negative dielectric anisotropy, an optically active cholesteric or chiralnematic liquid crystal, a dichroic dye and a hexadecylpyridinium salt, having the following structural formula,



wherein X is a halogen atom.

4,482,474

PHOSPHOLIPID SOLUTIONS

Juergen Biedermann, Pulheim-Stommeln, and Hans Betzing, Kerpen-Horrem, both of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GMBH, Cologne, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,672

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218027

Int. Cl.³ B01J *13/00*; A61K *31/66*; A23J *7/02*

U.S. Cl. 252—311 **18 Claims**

1. Aqueous phospholipid solution comprising as solution promoter a hydroxyethyl amide of the general Formula I

$$CH_3(CH_2)_nCONH—CH_2—CH_2—OH \quad I$$

in which n is 3, 4 or 5.

11. Process for the preparation of an aqueous phospholipid solution containing 1 to 25 parts of a phospholipid comprising dissolving the phospholipid in water in the presence of a solution promotor of the general Formula I

$$CH_3(CH_2)_nCONHCH_2CH_2OH$$

in which n is 3, 4 or 5.

4,482,475

RESISTOR COMPOSITION FOR RESISTOR-INCORPORATED SPARK PLUGS

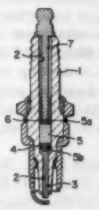
Masao Sakai, Kasugai; Yasuhiko Suzuki, Aichi, and Makoto Sugimoto, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jul. 15, 1983, Ser. No. 514,328

Claims priority, application Japan, Jul. 21, 1982, 57-125733

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—506 **3 Claims**



1. A resistor composition for resistor-incorporated spark plugs comprising:

100 parts by weight of a base mixture composed of 30–70% by weight of glass frit with the balance being an inorganic aggregate comprising alumina, zircon, mullite, silica, fused silica, magnesia, clay, silicon nitride, aluminium nitride, boron nitride or mixtures thereof;

0.1–10.0 parts by weight of a carbonaceous material calculated as carbon upon calcination;

0–30 parts by weight of a stabilizing agent for resistance under load consisting of one or more selected from the group consisting of oxides and carbides of rare earth elements and metals from Subgroup IVa, Va and VIa of the periodic table, ZnO, B_4C, SiC, TiB and TiN; and,

0.1 to 15 parts by weight of one or more of boron oxide, boric acid and a borate.

4,482,476

FLUOROELASTOMER-CONTAINING NON-TACKY ELECTRICALLY CONDUCTIVE COATING COMPOSITION

Tatsushiro Yoshimura; Norimasa Hondo, and Tsutomu Terada, all of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Nov. 8, 1982, Ser. No. 440,172

Claims priority, application Japan, Nov. 12, 1981, 56-182519

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 **8 Claims**

1. A fluoroelastomer-containing non-tacky electrically conductive coating composition which comprises

(a) a fluoroelastomer selected from highly fluorinated elastic copolymers,

(b) a fluororesin selected from the group consisting of polytetrafluoroethylene; copolymers of tetrafluoroethylene and at least one other ethylenically unsaturated monomer

selected from the group consisting of olefines, haloolefines and perfluoro(alkyl vinyl ethers); polychlorotrifluoroethylene; and polyvinylidene fluorides,

(c) a coupling agent selected from the group consisting of a silane coupling agent of the formula:

$$R^1SiR^2_{3-a}R^3_a \quad (I)$$

wherein R^1 is alkyl having at least one substituent selected from the group consisting of chlorine, amino, aminoalkyl, ureido, glicydoxy, epoxycyclohexyl, acryloyloxy, methacryloyloxy, mercapto and vinyl, or vinyl; R^2 and R^3 are each chlorine, hydroxy, C_1–C_{10} alkoxy, C_2–C_{15} alkoxy substituted alkoxy, C_2–C_4 hydroxyalkyloxy, or C_2–C_{15} acyloxy; and a is 0, 1 or 2;

a coupling agent of the formula:

$$T(OR)_4 \quad (II)$$

wherein T is titanium, zirconium, hafnium or thorium; and R is alkyl, cycloalkyl or aryl, or its derivatives which is derived by reacting the orthoacid ester (II) and at least one compound having at least one functional group;

$SnCl_4$;

aluminum isopropylate, mono-sec-butoxyaluminum diisopropylate, aluminum sec-butylate, ethylacetoacetatealuminum diisopropylate and aluminum tris(ethylacetate); and magnesium alcholoates;

(d) an electrically conducting material selected from the group consisting of carbon, graphite, gold, silver, copper, aluminum, titanium and anionic, monionic, cationic and amphoteric antistatic agents and

(e) a liquid vehicle,

wherein the weight ratio of the fluoroelastomer (a) and the fluororesin (b) is from 95:5 to 35:65, the weight ratio of the coupling agent (c) to the fluoroelastomer (a) is from 1:100 to 50:100, and the electrically conducting material is contained in such an amount that a coating film made from the composition has 10^8 ohm-cm or less of the volume resistivity.

4,482,477

PARTICULATE DETERGENT CONTAINING SILICONATE, COMPOSITION AND METHOD FOR MANUFACTURE THEREOF

Edwin Allen, Oupeye; Alan Dillarstone, Rocourt, and Joseph A. Reul, Heusy, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 366,713, Apr. 8, 1982, Pat. No. 4,421,657. This application Nov. 21, 1983, Ser. No. 554,095

Int. Cl.[3] **C11D** *3/075, 3/20, 11/02, 17/06*

U.S. Cl. 252—540 **4 Claims**

1. A particulate synthetic organic detergent composition which comprises a synthetic organic detergent selected from the group consisting of anionic and nonionic detergents and mixtures thereof, a building proportion of a builder for the synthetic organic detergent selected from the group consisting of water soluble and water insoluble builders and mixtures thereof, and a dispensing assisting proportion of a salt of a lower alkyl siliconic acid and/or polymerization product(s) thereof formed therefrom on storage.

3. A method of manufacturing a heavy duty laundering detergent composition, useful for automatic machine washing of laundry in water and dispensable from a charging compartment of such a machine by action of water being fed through such compartment, which includes a built synthetic organic detergent selected from the group consisting of anionic and nonionic detergents and mixtures thereof, and a building proportion of a builder for the synthetic organic detergent selected from the group consisting of water soluble and water insoluble builders and mixtures thereof, which comprises spray drying an aqueous crutcher mix of the synthetic organic detergent and the builder to particles of sizes within the No. 10 to 100 range, U.S. Sieve Series, and applying to the surfaces of such particles a dispensing assisting proportion of a salt of a lower alkyl siliconic acid and/or polymerization product(s) thereof formed therefrom on storage.

4,482,478

BLENDS OF BRANCHED CHAIN PHTHALATE ESTERS AND HALOGENATED BENZENE COMPOUNDS

David G. Shaw, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 188,361, Sep. 18, 1980, abandoned, which is a continuation of Ser. No. 13,563, Feb. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 682,776, May 3, 1976, abandoned, which is a continuation-in-part of Ser. No. 519,944, Nov. 1, 1974, abandoned. This application Nov. 8, 1982, Ser. No. 440,152

Int. Cl.[3] **H01B** *3/24*

U.S. Cl. 252—579 **28 Claims**

1. A fluid comprising a mixture of about 5 percent to about 40 percent by volume of a halogenated benzene and about 60 percent to about 95 percent by volume of an alkyl branched chain phthalate ester, said fluid having a dielectric constant greater than the dielectric constant of either of the halogenated benzene or the alkyl branched chain phthalate ester.

4,482,479

PROCESS FOR TREATING WASTE GAS IN REPROCESSING OF USED NUCLEAR FUEL

Kunio Kamiya; Hideo Yusa; Fumito Nakajima, all of Hitachi, and Masato Takeuchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,386

Claims priority, application Japan, Dec. 27, 1972, 47-129897

Int. Cl.[3] **G21F** *9/02*

U.S. Cl. 252—630 **13 Claims**

1. A process for separating and recovering Kr-85 by cryogenic distillation from a waste gas containing Kr-85 evolved from reprocessing of used nuclear fuel, which comprises catalytically converting hydrocarbons in the waste gas containing Kr-85 into non-explosive, condensible substances in the presence of oxygen and catalytically converting explosive, gaseous substances and materials capable of forming the explosive, gaseous substances in the waste gas containing Kr-85 into non-explosive, condensible substances in the presence of hydrogen gas, thereby obtaining a waste gas free of hydrocarbons and explosive substances and materials capable of forming the explosive substances, removing the condensible substances from the waste gas containing Kr-85, thereby obtaining a clean waste gas freed from said hydrocarbons and explosive substances and materials capable of forming the explosive substances and condensible substances prior to introducing the clean waste gas into a cryogenic distillation apparatus, and liquefying and distilling the clean waste gas into the cryogenic distillation apparatus, thereby separating and recovering Kr-85 from the clean waste gas.

4,482,480

POLYCARBOXYLIC ACID DERIVATIVES AND USES

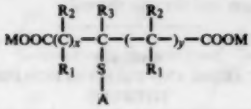
Clarence R. Bresson; Robert M. Parlman, and Benjamin R. Robles, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1983, Ser. No. 480,206

Int. Cl.[3] **C09K** *3/00;* **C22B** *1/00, 3/00*

U.S. Cl. 252—61 **9 Claims**

1. A composition comprising a mercapto polycarboxylic acid derivative represented by the formula:



where R_1 and R_2 are selected from the group consisting of H and an alkyl group having 1 to 3 carbon atoms, R_3 is selected from the group consisting of hydrogen, alkyl group having 1 to 3 carbon atoms, and COOM, M is selected from the group consisting of ammonium, Li, Na, K, Rb and Cs, A represents

and x and y are 0 or any integer from 1 through 7.

4,482,481

METHOD OF PREPARING NUCLEAR WASTES FOR TANSPORTATION AND INTERIM STORAGE

Gautam Bandyopadhyay, Naperville, and Thomas M. Galvin, Darien, both of Ill., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 1, 1982, Ser. No. 383,880

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—628 **12 Claims**

1. A method of preparing a substantially water-insoluble solid product for the interim storage of dried nuclear wastes consisting essentially of:

mixing the dried wastes as a powder, with at least 10 weight percent powdered, anhydrous amorphous sodium silicate to form a mixture, the sodium silicate having a SiO_2:Na_2O ratio of at least 2:1,

subjecting the mixture to an environment having a relative humidity of at least 70%, a temperature from about room temperature up to about 35° C. for a period of time sufficient for the mixture to become saturated with moisture thereby curing the mixture and forming a substantially water-insoluble solid product.

4,482,482

CESIUM TRIFLUOROACETATE SOLUTIONS FOR THE ISOLATION OF NUCLEIC ACIDS

Lawrence A. Haff, Sommerville, N.J., and Anthony J. Ewell, New York, N.Y., assignors to Pharmacia, Inc., Piscataway, N.J.

Filed Jan. 17, 1983, Ser. No. 458,359

Int. Cl.³ C07G *7/00*; C07H *17/00, 19/00, 21/00*

U.S. Cl. 260—112 R **13 Claims**

1. A method for isolating a nucleic acid and/or a protein fraction from a biological mixture containing a nucleic acid and/or a protein fraction, comprising adding the biological mixture to an aqueous solution of cesium trifluoroacetate, said solution having a density from about 1.4 to about 2.6 g/ml, and centrifuging the resulting mixture under ultracentrifugation conditions.

4,482,483

COMPOSITION OF INTRAVENOUS IMMUNE GLOBULIN

Willie M. Curry, New Rochelle, and David L. Farb, LaGrangeville, both of N.Y., assignors to Armour Pharmceutical Company, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 482,699, Apr. 6, 1983, abandoned. This application Sep. 2, 1983, Ser. No. 529,079

Int. Cl.³ A23J *00/00*; C07G *7/00*; C09H *00/00*; A61K *39/00*

U.S. Cl. 260—112 R **5 Claims**

1. An unmodified, native immune gamma globulin preparation for intravenous administration said preparation comprising:

1 to 5 parts by weight of at least 99.5% pure native gamma globulin consisting of about 64% IgG_1, 29% IgG_2, 6% IgG_3 and 1% IgG_4 having undergone no chemical or enzymatic modification, containing no residual chemicals therein which may deleteriously affect a patient, containing less than about 0.1% IgA, is essentially free of IgM and molecular aggregates, and having an anticompliment activity of less than 0.1 C'50 units per mg; 1 part of human serum albumin; about 0.45 to 0.9% w/v sodium chloride; about 2.5 to 10% w/v of a carbohydrate selected from the group consisting of maltose, sucrose and glucose.

4,482,484

COMPOUNDS AND HAPTEN-IMMUNOGLOBULIN CONJUGATES DERIVED FROM THEM

Robin G. Simmonds, Wokingham, England, assignor to Lilly Industries Limited, London, England

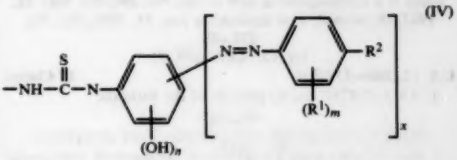
Division of Ser. No. 325,513, Nov. 27, 1981, Pat. No. 4,442,032. This application Dec. 5, 1983, Ser. No. 558,230

Claims priority, application United Kingdom, Dec. 4, 1980, 8038910

Int. Cl.³ C07G *7/00*; A61K *39/395*

U.S. Cl. 260—112 B **1 Claim**

1. A hapten-immunoglobulin conjugate which is an immunoglobulin modified with one or more groups of the formula



(IV)

4,482,485

METHOD OF PREPARATION OF HUMAN URINE ORIGIN COLONY-STIMULATING FACTOR AND KALLIKREIN

Satoshi Funakoshi, Katano; Kazuo Morimoto, Fukuchiyama; Morio Kuboyama; Nobuya Yanai, both of Tokyo; Muneo Yamada, Kawasaki, and Hajime Yokota, Tokyo, all of Japan, assignors to The Green Cross Corp., Osaka and Morinaga Milk Industry Co., Ltd., Tokyo, both of, Japan

Filed Jan. 4, 1984, Ser. No. 568,259

Claims priority, application Japan, Jan. 28, 1983, 58-11317

Int. Cl.³ A61K *35/22*; C07G *7/00*

U.S. Cl. 260—112 R **4 Claims**

1. A method of preparation of human urine origin colony-stimulating factor and kallikrein, respectively, which comprises concentrating urine of normal humans or a solution containing human urine origin colony-stimulating factor and kallikrein with respect to proteins contained therein, equilibrating the resulting concentrated liquid with a buffer solution containing a stabilizer, subjecting the liquid to high-performance gel filtration chromatography by introducing the liquid into a column which has been filled with a gel having a molecular exclusive limit of 10^5–$\times 10^5$ as determined with globular protein and equilibrated with said buffer solution to fractionating the colony-stimulating factor fractions and kallikrein fractions, and collecting the both.

4,482,486

ANALOGS OF VASOPRESSIN

Frantisek Brtnik, Prague; Tomislav Barth, Roztoky; Pavel Hrbas, Prague; Karel Jost, Prague; Ivan Krejci, Prague; Bela Kupkova, Prague; Alena Machova, Prague; Linda Servitova, Prague, and Jana Skopkova, Prague, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

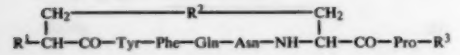
Filed Apr. 20, 1983, Ser. No. 486,863

Claims priority, application Czechoslovakia, Apr. 20, 1982, 2803-82; Nov. 19, 1982, 8301-82

Int. Cl.[3] **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **4 Claims**

1. Analog of vasopressin of the formula



wherein R^1 is selected from the group consisting of H and NH_2, R^2 is selected from the group consisting of CH_2S and S-S, and R^3 is selected from the group consisting of D-Arg and L-Orn, with all other chiral amino acids belonging to the L-series.

4,482,487

A-21978C CYCLIC PEPTIDES

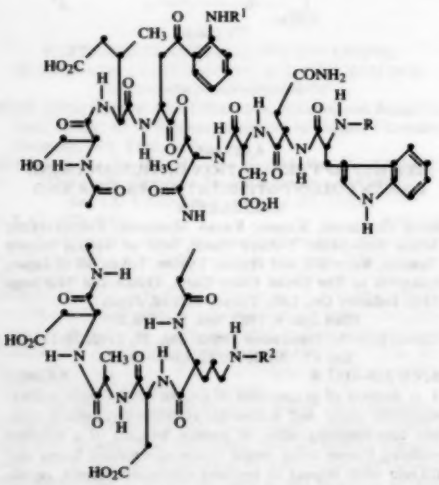
Bernard J. Abbott, Greenwood; Manuel Debono, Indianapolis, and David S. Fukuda, Brownsburg, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 493,446, Jun. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 380,497, May 21, 1982, abandoned. This application Jan. 31, 1984, Ser. No. 575,648

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 R **17 Claims**

1. An A-21978C cyclic peptide of the formula:



wherein R is selected from the group consisting of hydrogen, an amino-protecting group, 8-methyldecanoyl, 10-methylundecanoyl, 10-methyldodecanoyl, the specific C_{10}-alkanoyl group of A-21978C factor C_0 and the specific C_{12}-alkanoyl groups of A-21978C factors C_4 and C_5; R^1 and R^2 are, independently, hydrogen or an amino-protecting group; provided that, when R is other than hydrogen or an amino-protecting group, at least one of R^1 and R^2 must be an amino-protecting group; and the salts thereof.

4,482,488

ANTIBIOTIC A53868 AND PROCESS FOR PRODUCTION THEREOF

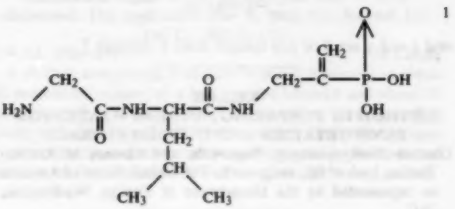
Ronald D. Johnson; Ralph M. Kastner, both of Indianapolis; Stephen H. Larsen, Carmel, and Earl E. Ose, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 424,805, Sep. 27, 1982, Pat. No. 4,463,092. This application Apr. 5, 1984, Ser. No. 596,953

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 R **9 Claims**

1. A53868 factor A of the formula:



and the salts thereof.

4,482,489

LIGHT-SENSITIVE DIAZONIUM TRIFLUOROMETHANE SULFONATES

Carmine A. DiPippo, Longmeadow, Mass., assignor to James River Graphics, Inc., South Hadley, Mass.

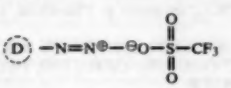
Continuation-in-part of Ser. No. 378,227, May 14, 1982, abandoned, which is a continuation of Ser. No. 208,072, Nov. 18, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,690

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1981, 3145406; France, Nov. 16, 1981, 81 21367; Netherlands, Nov. 16, 1981, 8105190; United Kingdom, Nov. 16, 1981, 8134470

Int. Cl.[3] **C07C** *113/04, 143/08;* **G03C** *1/52;* **C07D** *295/12*

U.S. Cl. 534—556 **5 Claims**

1. A monomeric diazonium trifluoromethane sulfonate having the structural formula:



wherein (D)—N=N— is the cation of a light-sensitive, aromatic diazonium compound.

4,482,490

N-(P-NITROPHENYL)-N'-(4-AMINO-2-FLUORO-TRIAZINEAMINO PHENYL)-1,4-DISAZOPHENYLENE DYES

Seiichi Imahori, Kawasaki; Toshio Niwa; Itaru Okada, both of Yokohama, and Kuninori Sato, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Japan

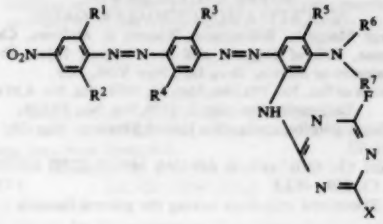
Continuation of Ser. No. 337,319, Jan. 5, 1982, abandoned, which is a continuation of Ser. No. 109,055, Jan. 2, 1980, abandoned. This application Dec. 6, 1982, Ser. No. 447,476

Claims priority, application Japan, Jan. 26, 1979, 54-7750

Int. Cl.[3] **C09B** *62/08, 62/09;* **D06P** *1/382, 3/66*

U.S. Cl. 534—797 **1 Claim**

1. A disazo dye for cellulose-containing fibers represented by the general formula



in which R^1 and R^2 independently represent a hydrogen atom, a halogen atom, a nitro group, a cyano group, a trifluoromethyl group, a lower alkoxycarbonyl group, a lower alkyl group or a lower alkoxy group; R^3, R^4 and R^5 independently represent a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkoxy-lower alkoxy group or an acylamino group, R^6 and R^7 independently represent a hydrogen atom; an allyl group, an aralkyl group, and a lower alkyl group which may be substituted with a halogen atom, a cyano group, a lower alkoxy group, a lower alkoxycarbonyl group, a hydroxy group or an acyloxy group; and X represents an amino group, a mono- or di-alkylamino group having 1-6 carbon atoms in total, an anilino group, a lower alkoxy group or a $—O—(R^8O)_n—R^9$ in which R^8 represents an ethylene group or a propylene group, R^9 represents a methyl group or an ethyl group, and n is an integer of 1-5.

4,482,491

THIAZOLINOAZETIDINONE DERIVATIVES AND PROCESS FOR THE PREPARATION OF THE SAME

Sigeru Torii; Hideo Tanaka; Junzo Nokami; Michio Sasaoka; Norio Saito; Takashi Shiroi, all of Okayama, and Akira Tanaka, Naruto, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

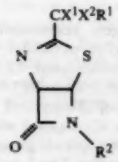
Filed Apr. 20, 1982, Ser. No. 370,034

Claims priority, application Japan, May 1, 1981, 56-67135; May 1, 1981, 56-67136; May 8, 1981, 56-69687; Nov. 17, 1981, 56-184877

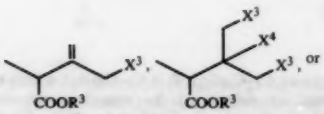
Int. Cl.³ C07D *205/08, 513/04, 417/12, 403/12*

U.S. Cl. 260—245.4 **9 Claims**

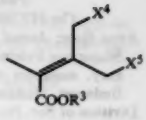
1. A thiazolinoazetidinone derivative represented by the formula



wherein X^1 and X^2 each represent a halogen atom; R^1 represents an aryl or an aryloxy; R^2 represents



-continued



wherein R^3 represents a lower alkyl substituted with at least one aryl group, a lower alkyl substituted with at least one aryloxy group or a lower alkyl optionally substituted with at least one halogen atom, X^3 and X^4, which are the same or different, each represent a halogen atom, and X^5 represents X^3 or X^4.

4,482,492

PREPARATION OF VITAMINS K_3 AND K_4 AND DERIVATIVES

Hans Kiefer, Wachenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 434,832

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1981, 3141443

Int. Cl.³ C07C *50/14*

U.S. Cl. 260—396 K **6 Claims**

1. 2-Methyl-8-acetoxy-1,4-dioxo-1,4,4a,5,8,8a-hexahydronaphthalene (IIIa).

4,482,493

METHOD FOR PREPARING BENZOQUINONES

Masakatsu Matsumoto, Sagamihara, Japan, and Satoru Ito, Rockville, Md., assignors to Sagami Chemical Research Center, Tokyo, Japan

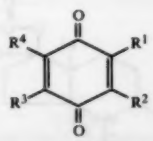
Filed Oct. 18, 1983, Ser. No. 542,975

Claims priority, application Japan, Oct. 22, 1982, 57-184684; Feb. 28, 1983, 58-30744; Aug. 2, 1983, 58-140615

Int. Cl.³ C07C *50/04*

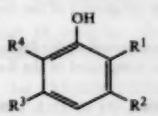
U.S. Cl. 260—396 R **16 Claims**

1. A method for preparing a benzoquinone represented by the general formula:



(I)

where each of R^1, R^2, R^3 and R^4 is a hydrogen atom, an alkyl group or an aryl group, which comprises reacting a phenol represented by the general formula:



(II)

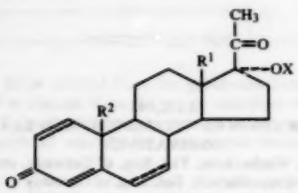
where R^1, R^2, R^3 and R^4 are as defined above, with hydrogen peroxide in the presence of a ruthenium catalyst.

4,482,494
PROCESS FOR PREPARING 17α-HYDROXY-PREGN-4-EN-3,20-DIONE

Anna Boor; Jozsef Toth; Tamas Szen; Laszlo Gabor; Piroska Major nee Feistner, and Sandor Holly, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

Division of Ser. No. 365,015, Apr. 2, 1982, Pat. No. 4,368,160.
This application Oct. 20, 1982, Ser. No. 435,494
Claims priority, application Hungary, Apr. 16, 1981, 989
Int. Cl.³ C07J 5/00
U.S. Cl. 260—397.4 1 Claim

1. A process for the preparation of a compound of the formula (I)



(I)

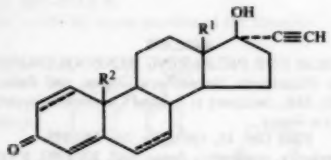
wherein

R^1 stands for a methyl or an ethyl group;

R^2 represents a hydrogen atom or a methyl group; and

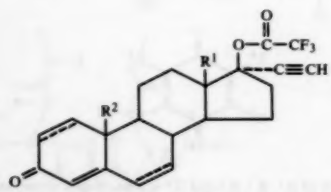
X is a hydrogen, formyl, or acetyl; and the bond indicated by a dotted and a continuous line stands for a single or a double bond between the two neighboring carbon atoms, which comprises the steps of

(a) acylating a compound of the formula (III)



(III)

with trifluoroacetic acid in the presence of an acid binding agent at a temperature of 0° to 5° C. to yield a compound of the formula (II)



(II)

and

(b) reacting the compound of the formula (II) with formic acid to yield the compound of the formula (I) where X is formyl; or

(b_1) reacting the compound of the formula (II) with acetic acid to yield the compound of the formula (I) where X is acetyl; or

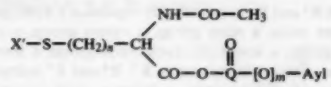
(b_2) following either (b) or (b_1), treating the reaction product with hydrochloric acid and methyl alcohol to yield the compound of the formula (I) where X is hydrogen.

4,482,495
MIXED ANHYDRIDES OF N'-ACETYLAMINOTHIOALKANOATES

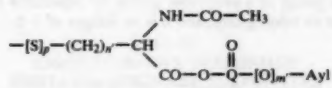
George Margetts, Billinghurst; Roderic S. Andrews, Chapelhouse, both of England, and Jean Legros, Dijon, France, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 909,846, May 26, 1978, Pat. No. 4,181,719.
This application Apr. 2, 1979, Ser. No. 26,329
Claims priority, application United Kingdom, May 26, 1977, 22218/77
Int. Cl.³ C07C 149/00, 149/243, 149/43; C07D 309/08
U.S. Cl. 260—402.5 2 Claims

1. The mixed anhydride having the general formula



wherein n is 1 or 2, m is zero or 1, Q represents either a carbon atom or a sulfinyl group S=O where m is zero or a carbon atom when m is 1, "Ayl" represents an alkyl group with 1–20 carbon atoms, an aryl group with 6–20 carbon atoms, an alkaryl group with 7–20 carbon atoms or an aralkyl group with 7–20 carbon atoms, and X' is a hydrogen atom, tetrahydro-2-pyranyl, a methyl group, or a mixed anhydride group conforming to the general formula



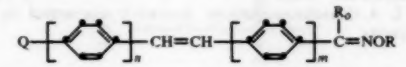
wherein Q and Ayl both have their previously-indicated meanings, n' is 1 or 2, m' is zero or 1, and p is zero or 1.

4,482,496
STILBENE COMPOUNDS

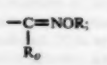
Kurt Weber, Basle, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,853
Claims priority, application Switzerland, Jun. 12, 1981, 3880/81
Int. Cl.³ C07C 121/78
U.S. Cl. 260—465 E 7 Claims

1. A stilbene compound of the formula



wherein Q is hydrogen; benzoxazolyl; benzimidazolyl; v-triazolyl; 1,3,4-oxdiazolyl; pyrimidyl; pyridazinonyl; pyrazinyl; s-triazinyl; 1,3,4-oxdiazolonyl; 1,2,4-oxdiazolyl; pyrazolyl; isoxazolyl; benzisoxazolyl; oxazolo[5,4-b]pyridyl; oxazolo[5,4-e]pyridyl; 1,2,4-triazolo[1,5-a]pyridyl; —CH=C(R_1)(R_2), in which R_1 is hydrogen, C_1–C_6alkyl which is unsubstituted or substituted by non-chromophoric groups, and R_2 is alkoxycarbonyl containing altogether 2 to 7 carbon atoms, cyano, carboxyl, carbamoyl, phosphonic acid dialkyl ester, C_1–C_6alkyl or arylsulfonyl; or



R_0 is hydrogen or C_1–C_6alkyl; R is C_1–C_6alkyl which is unsubstituted or substituted by non-chromophoric groups, C_2–C_5alkenyl, C_2–C_5alkynyl, di(C_1–C_4)al-

kylamino(C_1–C_4)alkyl, C_1–C_4hydroxyalkyl, C_1–C_4phenylalkyl or cycloalkyl containing 5 to 12 ring members; and each of m and n independently of the other is 1 or 2.

4,482,497

PREPARATION OF CARBOXYLIC ACIDS

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,094
Int. Cl.³ C07C *51/12*
U.S. Cl. 260—413 **4 Claims**

1. A process for the preparation of a carboxylic acid which comprises reacting a hydrocarbyl alcohol of the formula ROH wherein R is alkyl of 1–11 carbon atoms or phenyl or benzyl with carbon monoxide in the presence of a molybdenum-nickel-alkali metal or a tungsten-nickel-alkali metal co-catalyst component and in the presence of an iodide or bromide.

4,482,498

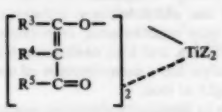
COLOR STABLE CHELATED TITANATE COMPOSITIONS

James R. Falender, Sanford, and Angelika H. McHale, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 308,704, Oct. 5, 1981, Pat. No. 4,391,937. This application Dec. 23, 1982, Ser. No. 452,564
Int. Cl.³ C07F *7/28*
U.S. Cl. 260—429.5 **15 Claims**

1. A composition consisting essentially of the product obtained by mixing, under conditions which substantially exclude moisture,

(a) a chelated titanium compound having a formula



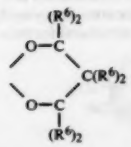
in which

R^3 is a monovalent hydrocarbon radical having from 1 to 18 inclusive carbon atoms,

R^4 is a monovalent radical selected from the group consisting of hydrocarbon radicals having from 1 to 18 carbon atoms, and hydrogen,

R^5 is a monovalent radical selected from the group consisting of hydrocarbon radicals and aliphatic hydrocarbonoxy radicals each having from 1 to 18 inclusive carbon atoms, and

Z is a radical selected from the group consisting of monovalent aliphatic hydrocarbonoxy radicals and monovalent acyloxy radicals, each having from 1 to 18 inclusive carbon atoms; hydroxyl radical; divalent oxygen atoms forming a TiOTi linkage; and when taken together form an alkanedioxy radical of the formula

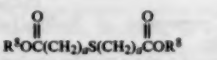


in which

R^6 is a radical selected from the group consisting of hydrogen atom and monovalent aliphatic hydrocarbon radicals having not more than 8 carbon atoms, the total number of carbon atoms in the alkanedioxy radical is not more than 18, and

(b) from 1 to 100 parts by weight based on 100 parts by weight of (a), of an additive soluble in the chelated titanium compound and being

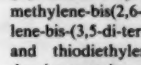
(1) an ester of thioalkanoic acid of the formula



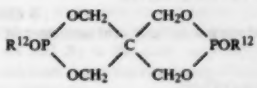
wherein R^8 is an alkyl group containing from 1 to 15 inclusive carbon atoms and a is an integer of from 1 to 4 inclusive,

(2) di-tertiary-butyl phenol containing compounds selected from the group consisting of 2,6-di-tert-butyl-4-methylphenol, tetrakis[methylene-3-(3',5'-di-tert-butyl-4'-hydroxyphenyl)propionate]methane, octadecyl-3-(3',5'-di-tert-butyl-4'-hydroxyphenyl)propionate, 4,4'-methylene-bis(2,6-di-tert-butylphenol), 1,6-hexamethylene-bis-(3,5-di-tert-butyl-4-hydroxyhydrocinnamate), and thiodiethylene-bis-(3,5-di-tert-butyl-4-hydroxyhydrocinnamate),

(3) an organic phosphite selected from the group consisting of the formula



wherein R^{10} and R^{11} are selected from the group consisting of linear or branched alkyl radicals of from 1 to 18 carbon atoms, and phenyl radical, wherein b is 0 or 1, and the formula



wherein R^{12} is a linear or branched alkyl radical of from 1 to 18 carbon atoms, or

(4) a mixture of (2) and (3), the composition having a color of less than 13 as determined by the Gardner Color Scale and being stored under conditions substantially excluding moisture.

4,482,499

PROCESS FOR THE PREPARATION OF ISOCYANATES BY THERMAL CLEAVING OF URETHANES

Franz Merger, Frankenthal; Gerhard Nestler, Ludwigshafen; Rolf Platz, Mannheim; Friedrich Towae, Ludwigshafen, and Hans Hellbach, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,283
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142627
Int. Cl.³ C07C *118/00*
U.S. Cl. 260—453 P **11 Claims**

1. A process for the preparation of an organic isocyanate which comprises thermally cleaving a urethane at temperatures of 175° C. to 600° C. in the presence of carbon.

4,482,500

PROCESS FOR THE PREPARATION OF N-ALLYL-O-ALKYL THIONOCARBAMATES

Morris E. Lewellyn, Bridgeport, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 23, 1982, Ser. No. 410,689

Int. Cl.³ C07C *155/02*

U.S. Cl. 260—455 A 17 Claims

1. A process for the preparation of N-allyl-O-alkyl thionocarbamates, comprising:

(a) reacting, in the presence of a phase transfer catalyst, an alkali metal or ammonium cyanide, sulfur, and an allyl halide in water as the reaction solvent to produce a reaction mixture comprising an organic phase containing an allyl isothiocyanate and an aqueous phase;

(b) separating said aqueous phase from said organic phase; and

(c) reacting said allyl isothiocyanate with an alcohol in the presence of a catalyst useful for the production of urethanes to produce said N-allyl-O-alkyl thionocarbamate.

4,482,501

PROCESS FOR PRODUCING AMINOARYL-β-SULFATOETHYLSULFONE

Nobuzi Nishimura, Toyonaka; Utazi Sawa; Takemi Tokieda, both of Nara; Shun-ichi Hayakawa, and Yasuo Tezuka, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 169,497, Jul. 16, 1980, Pat. No. 4,346,046. This application Jun. 16, 1982, Ser. No. 388,956

Claims priority, application Japan, Jul. 19, 1979, 54-92201; Aug. 9, 1979, 54-102075; Aug. 14, 1979, 54-103656; Apr. 8, 1980, 55-46343

Int. Cl.³ C07C *141/18*

U.S. Cl. 260—458 C 5 Claims

1. A process for producing a sulfuric acid semiester of the formula (I):

$$NH_2\text{-}A\text{—}SO_2CH_2CH_2OSO_3H)_n \quad (I)$$

wherein A is phenylene or naphthylene, which may be substituted with one or two methyl or methoxyl groups, and n is an integer of 1 or 2, which comprises subjecting a mixture of an acid and a compound of the formula (II),

$$B\text{-}NH\text{-}A\text{—}SO_2CH_2CH_2OH)_n \quad (II)$$

wherein A and n are as defined above, and B is hydrogen or a group capable of being hydrolyzed by an acid, to reaction, while removing a volatile matter from the reaction system and subjecting the mixture to a kneading action, whereby esterification of said compound of the formula (II) wherein B is hydrogen or hydrolysis and esterification of said compound of the formula (II) wherein B is a group capable of being hydrolyzed by an acid is effected, the acid in the reaction system being sulfuric acid, the amount of the acid being 1 to 2 moles per mole of β-hydroxyethylsulfonyl group in the compound of the formula (II), and the initial concentration of the acid being 40 to 98% by weight.

4,482,502

PREPARATION OF BIARYL COMPOUNDS

Venkataraman Ramachandran, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 25, 1983, Ser. No. 488,192

Int. Cl.³ C07C *121/66, 69/616*

U.S. Cl. 260—465 G 29 Claims

20. In a process for coupling 2-(4-amino-3-fluorobenzene)-propionitrile with benzene in the presence of an alkyl nitrite to form 2-(2-fluoro-4-biphenyl)propionitrile via a diazo intermediate, the improvement which comprises conducting the reaction in the presence of aboout 0.04–0.6 mol of an acid having a dissociation constant of at least about 1.0×10^{-1} at 25° C. and about 0.08–1.3 mols of a cuprous halide catalyst per mol of the 2-(4amino-3-fluorobenzene)propionitrile.

4,482,503

PROCESS FOR PRODUCING ALIPHATIC NITRILES

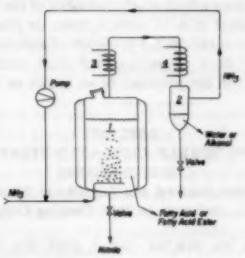
Peter Hofmann, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Jul. 20, 1982, Ser. No. 400,026

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1981, 3131968

Int. Cl.³ C07C *120/00, 120/08*

U.S. Cl. 260—465.2 6 Claims



1. A single vessel batch process for producing aliphatic mononitriles comprising:

(a) mixing a substrate selected from the group consisting of carboxylic acids having 4 to 22 carbon atoms or carboxylic alkylesters of carboxylic acids having 4 to 22 carbon atoms, and monoalkanols having 1 to 8 carbon atoms with a catalyst consisting of iron or compounds selected from the group consisting of iron chlorides, iron nitrates, iron sulfates, iron acetates, iron naphthenates, iron laurates, iron palmitates, iron stearates, and iron oxides in a liquid phase, wherein said catalyst has a concentration of about 0.3 to 3 percent by weight of iron;

(b) adding excess ammonia to said liquid phase as a reactant;

(c) heating the reactants of (a) and (b) in said liquid phase at a temperature of about 150° to 290° C. to form mononitriles corresponding to said carboxylic acids or said carboxylic alkylesters; and

separating said mononitriles by distillation.

4,482,504

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

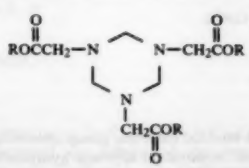
Continuation-in-part of Ser. No. 412,624, Aug. 30, 1982, Pat. No. 4,425,284. This application Feb. 22, 1983, Ser. No. 468,223

Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.5 F 7 Claims

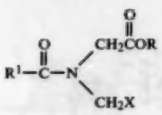
1. A method of preparing N-phosphonomethylglycine comprising

(a) reacting in a solvent at a temperature between about 0° C. to about 150° C. one mole of 1,3,5-tricarboalkoxymethylhexahydro-1,3,5-triazine having the structural formula



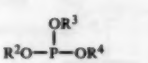
wherein R is an aliphatic or aromatic group with at least 3 moles of an acyl halide of the formula

wherein X is chlorine, bromine or iodine and R^1 is an aliphatic or aromatic group to form the N-carboalkoxymethyl-N-halomethyl amide of the acyl chloride which has the structural formula

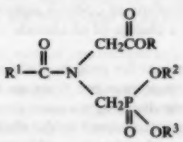


wherein X, R and R^1 are as defined above;

(b) reacting the amide formed in step (a) with up to a 10 mole excess of a phosphite of the formula



wherein R^2 and R^3 are both aromatic groups or both aliphatic groups, and R^4 is an alkali metal at a temperature between about 0° C. to about 150° C., to form a phosphonate compound of the formula



wherein R, R^1, R^2 and R^3 are as defined; and

(c) hydrolyzing the phosphonate formed in step (b) to yield N-phosphonomethylglycine.

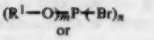
4,482,505

OLEFINIC ESTERS OF PHOSPHORUS CHLORIDES AND BROMIDES

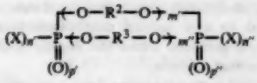
James E. Bunker, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1981, Ser. No. 234,560
Int. Cl.³ C07F 9/146, 9/14
U.S. Cl. 260—952 **8 Claims**

1. Polymerizable compounds, comprising an organic ester of one or more acids of phosphorus, said ester having chlorine or bromine bonded directly to phosphorus, and the organic radical of said ester containing at least one olefinic group, said compounds having the formulae;



or



wherein

m+n=3

m′ and m″ are zero or 1 and are the same or different,

n′ and n″ are zero to 4 and are the same or different, with the proviso that n′ and n″ are not both zero,

p′ and p″ are zero or 1 and are the same or different,

m′+m″+n′+2p′=3 or 5,

m′+m″+n″+2p″=3 or 5,

R^1 is a monovalent, olefinic radical which can be straight chain, branched, or cyclic, can contain skeletal hetero atoms, and can be unsubstituted or substituted with non-interfering moieties,

R^2 and R^3 are divalent, olefinic organic radicals which can be straight chain, branched, or cyclic, can contain skeletal hetero atoms, can be unsubstituted or substituted with non-interfering moieties, and are the same or different, and

X is Cl or Br, and each X is the same as or different from other X.

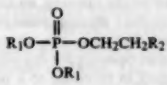
4,482,506

PROCESS FOR THE MANUFACTURE OF ALKYL DIARYL PHOSPHATE ESTERS

Joseph H. Finley, Metuchen, and Hsiang P. Liao, Princeton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 4, 1982, Ser. No. 432,472
Int. Cl.³ C07F 9/09
U.S. Cl. 260—982 **6 Claims**

1. A process for the manufacture of a substantially monoalkyl diaryl phosphate having the formula;



wherein R_1 is the same or a different aromatic radical selected from the group consisting of phenyl and substituted phenyl radicals and R_2 is the same or a different aliphatic radical selected from the group consisting of alkyl and alkoxy radicals, which comprises:

(a) heating about 2.0 moles of an alcohol characterized by a boiling point above about 170° C. and having the formula:

$$R_2CH_2CH_2OH$$

wherein R_2 is the same or a different aliphatic radical selected from the group consisting of alkyl and alkoxy radicals with a catalytic amount of a phenoxide to form an alkoxide of sid alcohol and phenol in accordance with the following equilibria:

$$\phi OM + R_2CH_2CH_2OH \rightleftharpoons \phi OH + R_2CH_2CH_2OM$$

wherein M is an alkali metal, the said phenoxide being an alkali metal phenoxide formed by the reaction of an alkali metal carbonate selected from the class consisting of sodium carbonate and potassium carbonate with phenol;

(b) adding to the equilibria reaction mixture of step (a) about 1.0 mole of a triaryl phosphate of the formula:

$$(R_1O)_3P{=}O$$

under a nitrogen atmosphere and maintaining the temperature at about 100° C. with agitation for about an hour;

(c) heating the reaction mixture from step (b) at 100° C. to 140° C. under vacuum to remove aromatic and aliphatic alcohols from the reaction mixture;

(d) filtering the reaction mixture from the preceding step, and

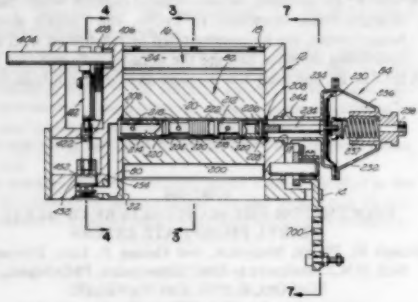
(e) distilling the filtrate in a wiped film still under vacuum and at a temperature below the decomposition temperature of said mixed phosphoric acid ester composition to obtain the desired product.

4,482,507

SONIC CARBURETOR

Willard Z. Kendig, Yettem, Calif., assignor to Kenna Research International, Tustin, Calif.

Filed Jun. 14, 1982, Ser. No. 387,901
Int. Cl.³ F02M 7/22
U.S. Cl. 261—39 D **28 Claims**



1. A carburetor responsive to the activation of a throttle for controlling the mixing of a fuel from a storage tank with air for use in an internal combustion engine comprising:

a carburetor housing having an air intake opening, an air-fuel discharge opening, and an air-fuel mixing passageway extending through the housing between the air intake opening and the air-fuel discharge opening for drawing air in through the air intake opening in response to a partial vacuum pressure created by the operation of the internal combustion engine, and discharging a metered amount of the fuel into the air passing through the air-fuel mixing passageway, the air fuel mixture resulting thereafter being drawn through the air-fuel discharge opening, into the engine in response to the partial vacuum, the direction of air flow through the housing defining a flow direction;

a fuel dispersion assembly comprising:

a dispersion bar mounted to the housing and extending across the air-fuel mixing passageway, transverse to the flow direction, the dispersion bar having a central flow passageway extending longitudinally therethrough and a plurality of fuel dispersion slits extending from the flow passageway through the dispersion bar and opening in a direction transverse to the flow direction; and

a spool valve rod mounted in the flow passageway for being axially moveable therein, the spool valve rod having a central fuel transfer passageway and a plurality of dispersion orifices extending from the fuel transfer passageway through the spool valve rod for enabling fuel to flow from the fuel transfer passageway into the flow passageway of the dispersion bar, the spool valve rod being longitudinally movable in the flow passageway for variably closing the fuel dispersion slits to regulate the flow of fuel from the flow passageway through the fuel dispersion slits;

means for longitudinally moving the spool valve rod in the flow passageway in response to variations in the volume of metered fuel flowing into the fuel transfer passageway of the spool valve rod;

means for metering the fuel flow into the fuel transfer passageway of the spool valve rod;

variable passageway constriction means in the air-fuel mixing passageway for variably opening and closing the air-fuel mixing passageway in fluctuable response to the activation of the throttle and the partial vacuum of the engine;

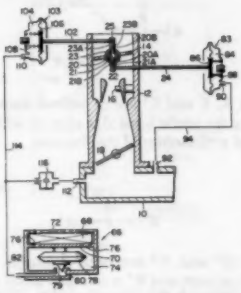
linkage means between the fuel flow metering means and the variable passageway constriction means for causing the fuel flow metering means to increase the flow of fuel when the variable passageway constriction means is opening and to decrease the flow of fuel when the variable passageway constriction means is closing.

4,482,508

ALTITUDE COMPENSATION DEVICE FOR INTERNAL COMBUSTION ENGINE

Hidemi Onaka, and Mamoru Yoshioka, both of Susono, Japan, assignors to Toyota Jidosha Kobushiki Kaisha, Japan

Filed Dec. 21, 1982, Ser. No. 451,782
Int. Cl.³ F02M 1/14
U.S. Cl. 261—39 A **4 Claims**



1. An altitude compensation device for an internal combustion engine for controlling an opening degree of a choke valve in accordance with a change of an altitude of the engine, comprising:

first diaphragm means for progressively opening the choke valve as a vacuum pressure from an intake passage increases, said first diaphragm means comprising:

a first diaphragm connected to the choke valve;

a first diaphragm chamber defined by said first diaphragm and communicated with the intake passage to introduce the vacuum pressure in the intake passage into said first diaphragm chamber, said vacuum pressure biasing said first diaphragm to move in such a direction as to open the choke valve; and

a first spring accomodated in said first diaphragm chamber and biasing said first diaphragm to move in such a direction as to close the choke valve;

second diaphragm means for progressively opening the choke valve as the vacuum pressure from the intake passage increases, said second diaphragm means comprising:

a second diaphragm connected to the choke valve;

a second diaphragm chamber defined by said second diaphragm and communicated with the intake passage to introduce the vacuum pressure in the intake passage into said second diaphragm chamber, said vacuum pressure biasing said second diaphragm to move in such a direction as to open the choke valve; and

a second spring accomodated in said second diaphragm chamber to move in such a direction as to close the choke valve;

air bleed means for compensating the vacuum pressure to be introduced to said second diaphragm means with the atmospheric pressure when the engine is at less than a pre-determined altitude;

first and second arms projecting from a rotational axis of the choke valve;

a first choke lever connecting said first arm and said first diaphragm; and

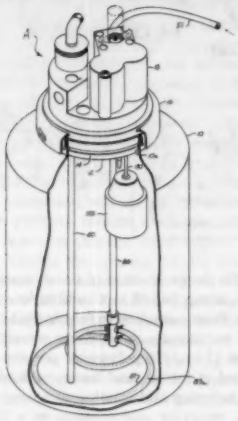
a second choke lever connecting said second arm and said second diaphragm.

4,482,509

CARBONATING APPARATUS

Frank M. Iannelli, Spartanburg, S.C., assignor to Gerlach Industries, Inc., Spartanburg, S.C.

Filed Mar. 4, 1983, Ser. No. 472,001
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—64 B **10 Claims**



8. A pressure regulator valve assembly for delivering a restricted flow of fluid and cutting off a restricted and unrestricted flow of the gas in response to an excess pressure comprising:

a first passage adapted for connection to a source of pressurized gas;

a first chamber communicating with said first passage;

a regulator valve member carried in said first chamber;

a second passage connected to said source of pressurized gas via said first chamber;

a control valve chamber communicating with said second passage;

a third passage connected to said control valve chamber;

a control valve carried in said control valve chamber selectively opening and closing communication between said second and third passages;

a gas dispensing chamber communicating with said third passage including a valve seat opening for communicating with an interior of a carbonating vessel;

said pressure regulator valve member having a restricted passage communicating between said first chamber and said gas dispensing chamber;

said second passage, said control valve chamber, said third passage, and said dispensing gas chamber establishing a relatively unrestricted gas flow path;

said pressure regulator valve being actuated in response to an excess of gas pressure to close off said valve seat of said gas delivery chamber and thus both said restricted and unrestricted gas flows into said carbonator vessel.

4,482,510

SELF-PROPELLED JET AERATOR

Boris M. Khudenko, Southfield, Mich., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed Dec. 4, 1980, Ser. No. 212,881
Int. Cl.³ C02F *7/00*
U.S. Cl. 261—91 **6 Claims**

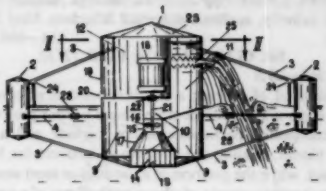
1. A self-propelled device for aeration and mixing of a deep and wide body of water comprising in combination:

a floating structure supported by pontoons on the water;

said floating structure including a water compartment supported by the said pontoons;

orifice means located in the outer wall of the said water compartment for discharging water jets in the direction opposite to the direction of the rotation of the said pontoon structure and also in sideways directions;

means for pumping water from the said water body into the said water compartment so as to supply water to said orifice means;



said means for pumping water comprising a motor and a pump;

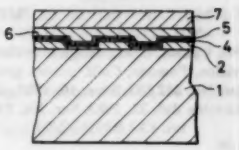
guide means secured to the said pontoon structure to guide said floating structure in a helical path.

4,482,511

METHOD OF MANUFACTURING A STAMPER FOR INFORMATION STORAGE DISCS

Shigemaru Komatsubara, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 20, 1982, Ser. No. 410,114
Claims priority, application Japan, Aug. 21, 1981, 56-131216
Int. Cl.³ B29D *17/00*
U.S. Cl. 264—22 **11 Claims**



1. A method of manufacturing a stamper for information storage discs, comprising the steps of:

providing a master of glass including a photoresist layer having pits thereon which represent information signals;

depositing a film of metal on said photoresist layer;

depositing in a vacuum a first polymerized release film of non-metallic material having low surface energy capable of facilitating physical separation of a stamper blank therefrom on said film of metal to thereby provide a stamper-forming master having a first signal surface containing said pits;

placing a substantially transparent plate on said signal surface with a layer of radiation curing resin interposed therebetween;

irradiating said layer of radiation curing resin with radiation through said substantially transparent plate to harden said layer of radiation curing resin;

separating said substantially transparent plate and said hardened layer as a unitary stamper blank from said first film of said stamper-forming master, said unitary stamper blank having a second signal surface complementary to said first signal surface; and

depositing a second polymerized release film having low surface energy on said second signal surface of said stamper blank, thereby forming a stamper.

4,482,512
MAKING SILICON CARBIDE BODIES

John E. Alsop, Billericay, England, assignor to Morganite Special Carbons Limited, London, England

PCT No. PCT/GB82/00151, § 371 Date Jan. 21, 1983, § 102(e) Date Jan. 21, 1983, PCT Pub. No. WO82/04248, PCT Pub. Date Dec. 9, 1982

PCT Filed May 25, 1982, Ser. No. 463,889

Claims priority, application United Kingdom, May 29, 1981, 8116551

Int. Cl.³ C04B 35/56; C01B 31/36

U.S. Cl. 264—29.1 6 Claims

1. A method of making a reaction-bonded silicon carbide body by steps which include preparing a porous preform comprising compacted particulate silicon carbide and a carbon-yielding binder, heating the preform to convert the binder to carbon and, while the preform in a vacuum or inert atmosphere is in contact with a source of silicon in the form of a compacted silicon cake, made from ingredients including particulate silicon and a carbon-yielding binder, to cause melting and migration into the preform of silicon from the silicon cake, characterised thereby that the silicon cake is made essentially only of silicon metal in flake form and the binder, the amount of binder used in making the silicon cake being at least 10% by weight of the silicon, and the binder, when mixed with the silicon, is in such liquid state that it wets the silicon substantially throughout and provides a coating of binder on surfaces of substantially all the silicon flakes.

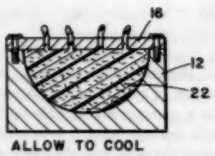
4,482,513
METHOD OF MOLDING FOAM/ALUMINUM FLAKE MICROWAVE LENSES

Craig R. Auletti, Upland, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Division of Ser. No. 242,503, Mar. 10, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 516,337

Int. Cl.³ B29D 27/04

U.S. Cl. 264—39 15 Claims



1. A method of making a microwave lens comprising the steps of:

selecting a mold having a cavity of the desired configuration for the controlled directing of microwaves;

polishing the walls of said cavity;

preheating said mold to a predetermined temperature;

selecting and preparing a mixture consisting of low density polyurethane foam components and fine aluminum flakes;

filling said mold cavity with said mixture;

selecting a venting cover having a predetermined venting characteristic;

installing the cover on the mold cavity;

allowing the mold to cool and simultaneously allowing the contents to expand and cool;

opening said mold by removing said venting cover; and

removing the formed lens from the mold.

4,482,514
PROCESS FOR THE PRODUCTION OF AN ULTRAFILTRATION MEMBRANE FROM POLYAMIDE

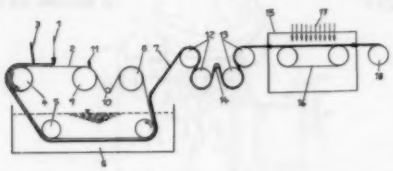
Erich Schindler, Aschaffenburg, and Franz Maier, Obernburg, both of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Jul. 20, 1981, Ser. No. 285,136

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028213

Int. Cl.³ B29D 27/04

U.S. Cl. 264—41 14 Claims



1. Process for the production of a cast membrane suitable for ultrafiltration, composed of an ultrafiltration skin and a porous support layer, from a solution in formic acid of a polyamide or a mixture of polyamides, comprising providing as a casting solution about 12 to 22% polyamide and about 1 to 7% polyethylene glycol in formic acid having a minimum concentration of 75%, bringing said solution to a temperature of below about 18° C., applying said solution as a thin layer onto a carrier film resistant to the components of said solution, moving said applied solution on said carrier film through a precipitating and washing bath moving countercurrent to said moving carrier film, removing said applied solution from said precipitating and washing bath, stripping said applied solution as a coagulated and washed membrane from said carrier film, stretching said coagulated and washed membrane in at least one direction from about 1.5:1 to 2.5:1 and drying said stretched coagulated and washed membrane.

4,482,515
METHOD OF AND APPARATUS FOR PRODUCING MOLDED ARTICLES FROM POURABLE COMPOUNDS

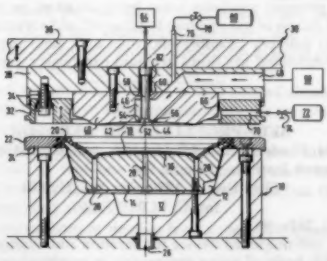
Eugen Bühler, Schleifweg 3, D-8871-Burtenbach, Fed. Rep. of Germany; Klaus Strobel, Selb, and Karl Schwarzmeier, Selb-Oberweissenbach Nr. 89, both of Fed. Rep. of Germany, assignors to Eugen Bühler, Burtenbach and Hutschenreuther AG, Selb, both of, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,068

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128347

Int. Cl.³ B28B 3/02, 13/02

U.S. Cl. 264—102 10 Claims



1. In a method of producing molded articles form a pourable ceramic forming compound wherein an injection chamber with an outer cirucmferential periphery is formed between an

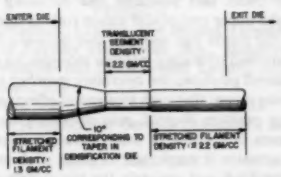
injection head and an isostatic compression molding tool, comprising the steps of supplying the pourable compound from a source to the injection chamber, fluidizing the pourable compound, establishing a negative pressure within the injection chamber and, by using the negative pressure, drawing the compound into and filling the injection chamber, and subsequently isostatically compressing the compound filled into the injection chamber and continuing to evacuate gases from the injection chamber during at least the initial phase of the compressing step, the improvement comprising providing a closable opening extending centrally into the injection chamber, and through which the pourable compound is filled into the injection chamber centrally of the outer circumferential periphery, flowing the pourable compound from the source through the injection head to the closable opening and fluidizing the pourable compound by injecting air within the injection head adjacent to the closable opening and before introducing the pourable compound into the injection chamber applying the negative pressure around the outer circumferential periphery of the injection chamber most remote from central closable opening, closing the opening into the injection chamber when the pourable compound has been filled into the injection chamber so that in the closed position the surface through which the opening extends forms a continuation of the surface of the injection chamber conforming to the shape of the molded article being formed, and applying the final compression to the molded article within the injection chamber while continuing to evacuate gases from the injection chamber.

4,482,516

PROCESS FOR PRODUCING A HIGH STRENGTH POROUS POLYTETRAFLUOROETHYLENE PRODUCT HAVING A COARSE MICROSTRUCTURE

Jeffery B. Bowman, Flagstaff, Ariz.; Daniel E. Hubis, Elkton, Md.; James D. Lewis, Flagstaff, Ariz.; Stephen C. Newman, Flagstaff, Ariz., and Richard A. Staley, Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Sep. 10, 1982, Ser. No. 416,466
Int. Cl.³ B29C *17/02*; B29D *27/00*
U.S. Cl. 264—127 **18 Claims**


ENTER DIE
EXIT DIE
TRANSLUCENT SEGMENT DENSITY: ≥ 2.2 GM/CC
10°
CORRESPONDING TO TAPER IN DENSIFICATION DIE
STRETCHED FILAMENT DENSITY: 1.3 GM/CC
STRETCHED FILAMENT DENSITY: ≥ 2.2 GM/CC

1. A process for producing a porous material of polytetrafluoroethylene polymer, which material is characterized by relatively large nodes interconnected by realtively long fibrils and having relatively high matrix tensile strength, the material having been produced from paste-extruded unsintered polytetrafluoroethylene extrudate, the process comprising the steps:

(a) providing an unsintered dry extrudate;

(b) increasing the density of the dry extrudate to greater than about 1.80 gm/cc at a temperature below the crystalline melt temperature of PTFE; and

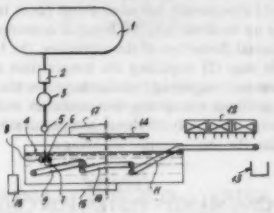
(c) stretching said densified dry extrudate at an elevated temperature less than the crystalline melt temperature.

4,482,517

METHOD AND EQUIPMENT FOR PRODUCING SOLID GRANULES OF PITCH IN THE FORM OF CYLINDERS CRUSHED AT THE ENDS

Valentino Petrini, and Stefano Preda, both of Milan, Italy, assignors to Carbochimica Italiana S.p.A., Milan, Italy

Filed Jun. 18, 1982, Ser. No. 389,997
Claims priority, application Italy, Sep. 7, 1981, 23815 A/81
Int. Cl.³ B02C *1/02*
U.S. Cl. 264—143 **3 Claims**



1. A method for manufacturing of solid pitch granules substantially free from cavities, airpockets, surface corrugations and surface irregularities comprising the following steps:

(a) melting a pitch;

(b) pre-cooling the molten pitch down to a temperature of approximately 70° C. above a softening point of said pitch;

(c) producing of a pitch rope from said pre-cooled pitch by extruding said pre-cooled pitch through calibrated nozzle means;

(d) cooling of said calibrated extruded pitch rope in a cooling fluid;

(e) cutting of said pitch rope on granules by passing said pitch rope between rotatable cutting means having a base portion and a plurality of blade portions extending radially and outwardly from said base portion and a rotatable supporting member situated substantially within a vicinity of said cutting means;

(f) final cooling of said granules in the cooling fluid; and

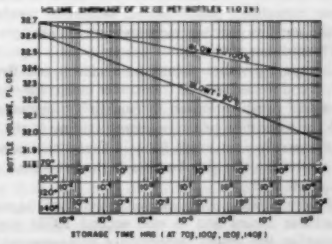
(g) drying of said granules.

4,482,518

METHODS FOR REDUCING POST-MOLD SHRINKAGE OF HOLLOW ORIENTED POLYETHYLENE TEREPHTHALATE CONTAINERS

Thomas E. Brady, Jr., Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 307,824, Oct. 2, 1981, abandoned. This application Feb. 9, 1983, Ser. No. 465,147
Int. Cl.³ B29C *17/07, 25/00*
U.S. Cl. 264—535 **5 Claims**



1. A method for reducing post-molding shrinkage in storage

at room temperature of a hollow oriented polyethylene terephthalate container; the method providing the steps of:

(1) bringing a polyethylene terephthalate parison to orientation temperation,

(2) blow molding the parison to provide a biaxially oriented container with larger dimensions than desired in the final container,

(3) heating the blow molded container at about 140° F. to 170° F. for about 10 minutes to seven seconds to shrink the container to the desired size whereby at least about 5% of the total time-temperature dependent shrinkage which would subsequently occur at about room temperature for a time up to about 100,000 hours is accomplished without substantial distortion of the container, the lower temperature in step (3) requiring the longer time and the higher temperature requiring the shorter time, the heating being done without restraining the container and without cyrstallizing the polyethylene terephthalate container to stabilize the same against shrinkage.

4,482,519

SUBCOOLING MARGIN SYSTEM FOR COOLING FLUID IN A NUCLEAR REACTOR

Russell M. Ball, and Edgar A. Womack, Jr., both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 22, 1981, Ser. No. 256,331
Int. Cl.³ G21C *7/36*
U.S. Cl. 376—216 **3 Claims**

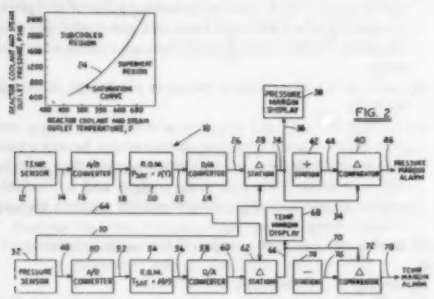


FIG. 2

1. A system for indicating the pressure and temperature margins within which a nuclear reactor is operating in the subcooled region of a saturation curve comprising:

first transducer means for measuring the highest temperature of the cooling fluid in a nuclear reactor;

second transducer means for measuring the lowest pressure of the cooling fluid in a nuclear reactor;

a first ROM station connected to said first transducer means containing a precalculated function of the saturation pressures corresponding to the temperatures measured by said first transducer means;

a second ROM station connected to said second transducer means containing precalculated saturation temperatures for the various pressure measurements made by said second transducer means;

a first comparing station means connected to said first ROM station and to said second transducer means for comparing the actual pressure sensed by said first transducer means with the saturation pressure corresponding to the temperature measurement made by said first transducer means and establish a signal indicative of the pressure margin to saturation; and

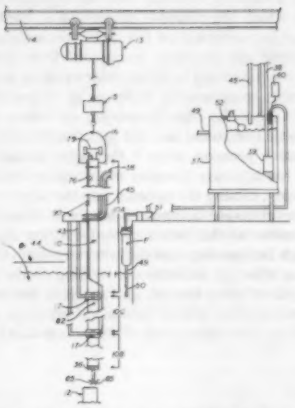
second comparing station means connected to said first transducer means and to said second ROM station for comparing the actual temperature measurement of said first transducer means with the saturation temperature corresponding to the pressure measurement made by said second transducer means to establish a signal indicative of the temperature margin to saturation.

4,482,520

FUEL PIN TRANSFER TOOL

John B. Randazza, Brunswick, Me., assignor to Maine Yankee Atomic Power Company, Augusta, Me.

Filed Jan. 8, 1982, Ser. No. 338,090
Int. Cl.³ G21C *19/10*
U.S. Cl. 376—261 **26 Claims**

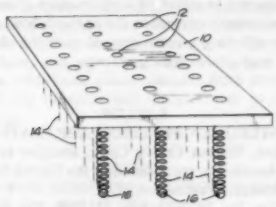


1. A fuel pin transfer tool, said tool including a tubular housing of such length that it may be suspended from a location above the water in a tank, in which a fuel pin assembly is stored at a substantial depth, with the lower portion of the housing extending downwardly in the water in vertical alignment with a selected one of the pins of said assembly and with the lower end of the tool close to and directly above said pin, axially spaced members within said housing and spaced from the ends thereof to establish a cylinder, a piston slidable in the cylinder, valve controlled fluid pressure operated means in communication with said cylinder and operable to reciprocate said piston between lower and upper positions, a tubular rod extending slidably through said cylinder-defining members and connected to said piston to travel therewith, pin latching means having pin-releasing and pin-gripping positions and connected to the lower end of said piston rod, and means operable to effect said positions and including an actuator secured to the upper end of said piston rod, an operating member within the piston rod and movable between first and second positions, said operating member movable by said actuator into said second position, the operating member so connected to the latching means that such movement effects and holds the pin-releasing position thereof, said operating means also including means in control of said operating member, except when said actuator is employed to effect such movement, to positively establish and maintain the pin-gripping position of the latching means, whereby with said fluid pressure operated means operated to drive said piston into its low position, and said actuator employed to effect said movement, said latching means is positioned to grip the selected pin, said pin gripped when said actuator is not so employed and then withdrawn when said fluid pressure operated means is employed to drive said piston upwardly, said cylinder and, the lower portion of the housing of such length that the gripped pin may be pulled free of the assembly and into said lower portion and whereby, with the fluid pressure operated means operated to return the piston to its low position, the gripped pin may be pushed downwardly, seated and released in its original or another location.

4,482,521
SUPPORT MEANS

Roger A. Bunce, Bourneville, England, and Rolf O. Studer, Basel, Switzerland, assignors to The Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom

Filed May 21, 1981, Ser. No. 265,709
Int. Cl.³ G01N *33/54, 33/48*
U.S. Cl. 422—102 **11 Claims**



1. An apparatus for supporting more than six reagent-coated objects during an analytical testing procedure in which the objects are immersed in a liquid analyte, comprising:

a substantially planar member having first and second planar surfaces parallel to one another, and having more than six siting means extending between said surfaces;

more than six elongated cage-like structures fixed to respective siting means and extending substantially perpendicularly downward from the planar member, said structures having a first end adjacent to the planar member and a second end remote from the planar member; each of said structures having a constriction at said second end, thereby retaining and supporting an object introduced to a siting means on the first surface side of the planar member and allowed to fall into the cage-like structure; and each of said structures having a shape at said second end corresponding to the shape of the object to be supported, thereby promoting drainage of the analyte liquid from the objects when the structures are removed from the liquid and, a reagent-coated, substantially spherically shaped object being located in each of said cage-like structures.

4,482,522
REDUCING SOCKET FOR RECEPTACLE CARRIERS OF LABORATORY CENTRIFUGES FOR ACCOMMODATIONS OF TEST TUBES OR TEST VESSELS

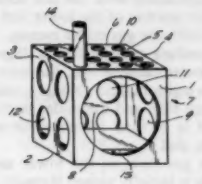
Hans-Dieter Baudisch, Leipzig, and Roland Lippoldt, Engelsdorf, both of German Democratic Rep., assignors to VEB Kombinat Medizin- und Labortechnik Leipzig, Leipzig, German Democratic Rep.

Filed Mar. 25, 1982, Ser. No. 361,951
Claims priority, application German Democratic Rep., Jul. 6, 1981, 231456
Int. Cl.³ B01L *9/06*
U.S. Cl. 422—104 **2 Claims**

1. A reducing socket for test tubes adapted to be disposed in receptacle carriers of a laboratory centrifuge, comprising

a rectangular cage formed of six rectangular side walls firmly jointed together, each side wall having means defining at least one test tube receiving opening and a plurality of peripherally located, equally sized burr holes, the test tube openings in each side wall being of a different diameter than the test tube openings in each of the other five walls and the burr holes of each side wall having like diameters, so that the test tubes having different diameters can be situated in and supported by the appropriate openings in the cage, and

a support plate to be disposed under the rectangular cage for supporting some test tubes disposed in said openings, said support plate having a plurality of projections extending unpwardly therefrom, said projections corresponding to the burr holes of each side wall, so that when the cage is

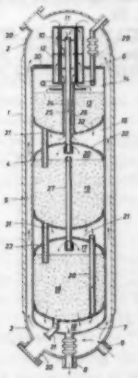


disposed on the support plate, the projections engage the burr holes to thereby immovably connect togeither the cage with the support plate.

4,482,523
AMMONIA SYNTHESIS CONVERTER

Robert B. Peterson, Houston, Tex., assignor to The M. W. Kellogg Company, Houston, Tex.

Filed Nov. 14, 1983, Ser. No. 550,858
Int. Cl.³ B01J *8/04*
U.S. Cl. 422—148 **7 Claims**



1. A vertical converter for exothermic reactions comprising:

(a) a cylindrical pressure shell having top and bottom outer heads contiguous therewith;

(b) a cylindrical inner shell disposed within substantially the entire length of the pressure shell and forming a shell annulus therewith, the inner shell having top and bottom inner heads contiguous with the inner shell;

(c) gas outlet means;

(d) gas inlet means in fluid communication with the shell annulus;

(e) an indirect heat exchanger having cold and hot heat exchange sides disposed within the converter, the cold heat exchange side being in fluid communication with the gas inlet means;

(f) three adiabatic catalyst beds arranged vertically within the converter, the three beds consisting of an upper catalyst bed, an intermediate catalyst bed, and a lower catalyst bed, each of the three beds being defined in part by the inner shell, and each of the three beds having respective inlet and outlet portions for axial gas flow through the catalyst beds wherein:

(i) the upper catalyst bed is disposed adjacent the indirect heat exchanger, the inlet portion of the upper bed is in fluid communication with the cold heat exchange side,

and the outlet portion of the upper bed is in fluid communication with the hot heat exchange side,

(ii) the lower catalyst bed is disposed in the lower portion of the converter, the inlet portion of the lower bed is in fluid communication with the hot heat exchange side and the outlet portion of the lower bed is in fluid communication with the gas outlet means,

(iii) the intermediate catalyst bed is disposed adjacently above the lower catalyst bed, the inlet portion of the intermediate bed is in fluid communication with the hot heat exchange side, and the outlet portion of the intermediate bed is in fluid communication with the gas outlet means, and

(iv) all of the gas flow to the lower and intermediate catalyst beds is initially passed through the upper catalyst bed;

(g) intermediate fluid barrier means for preventing direct fluid communication between the outlet portion of the upper catalyst bed and the inlet portion of the intermediate catalyst bed; and

(h) lower fluid barrier means for preventing direct fluid communication between the outlet portion of the intermediate catalyst bed and the inlet portion of the lower catalyst bed.

4,482,524

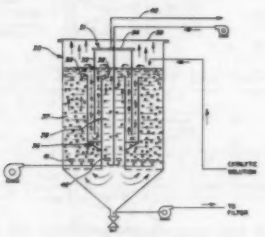
AUTOCIRCULATION APPARATUS

Leslie C. Hardison, Barrington, Ill., assignor to ARI Technologies, Inc., Palatine, Ill.

Division of Ser. No. 873,941, Jan. 31, 1978, Pat. No. 4,238,462. This application Nov. 24, 1980, Ser. No. 210,026

Int. Cl.³ B01D *53/36;* **B01J** *10/00, 19/26*

U.S. Cl. 422—170 **4 Claims**



1. In an apparatus for continuously chemically reacting a liquid reagent sequentially with two different gases in a single reaction vessel, the improvement comprising; a vertically disposed reaction vessel having vertically extending lateral walls and interconnecting upper and lower end walls adapted to hold a quantity of a liquid reagent, divider walls spaced inwardly from said lateral walls extending generally parallel to said lateral walls defining an inner reaction chamber and an outer reaction chamber, said divider walls having the upper and lower ends thereof spaced axially inwardly from the proximate upper and lower end walls of said vessel whereby said inner reaction chamber and said outer reaction chamber are in uninterrupted two way liquid flow communication at their upper and lower ends within said vessel when said vessel is filled with said liquid reagent to a level above the upper end of said divider walls, a first gas inlet means disposed adjacent the lower end of said inner reaction chamber adated for introducing a first reactive gas into said vessel at a controllable rate sufficient to reduce the density of said liquid reagent in said inner reaction zone below the density of the liquid in said outer reaction chamber and a second gas inlet means disposed adjacent the lower end of said outer reaction chamber adapted for introducing a second reactive gas into said vessel at a controllable rate sufficient to reduce the density of said liquid reagent in said outer reaction zone below the density of the liquid in said inner reaction chamber, each said gas inlet means being disposed relative to said reaction chambers so that gas discharged therefrom enters only the said reaction chamber proximal to the said gas inlet means, means for removing gas from the upper end of said vessel, means for removing at least a portion of said reaction solution and a solid reaction product from the lower end of said vessel, and each said gas inlet means having associated therewith control means for discharging said first gas at a rate different from the discharge rate of said second gas for making the density of said liquid reagent in either of said reaction chambers less than the density of said liquid reagent in the other of said reaction chambers; whereby the liquid reagent in either of said reaction chambers can be made to flow countercurrent to the upward flow of gas therein and thereby effecting greater control over the chemical reactions in the respective chambers.

4,482,525

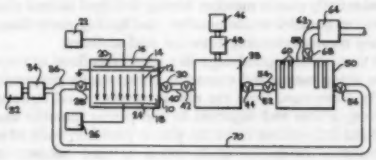
NITROGEN FIXATION APPARATUS

Hao-Lin Chen, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 291,899, Aug. 11, 1981, Pat. No. 4,399,012. This application Apr. 21, 1983, Ser. No. 487,491

Int. Cl.³ B01J *19/08*

U.S. Cl. 422—186 **8 Claims**



1. A nitrogen fixation apparatus, comprising:

wall means defining a discharge chamber including a pressure wall member disposed therein to separate said discharge chamber into a first segment adapted to maintain a vacuum of about 10^{-4} to 10^{-7} torr and a second segment adapted to maintain substantially atmospheric pressure, and a voltage to pressure ratio from about 5 to 15 kV/atm of O_2/cm, said discharge chamber producing a substantially equal volumetric electron discharge in said second segment to form NO from air;

means for providing electrical energy to said discharge chamber;

a first electrode operatively connected to said electrical energy-providing means disposed within said first segment;

a second electrode operatively connected to said electrical energy-producing means disposed within said second segment.

4,482,526

RECOVERY OF TUNGSTEN AND MOLYBDENUM FROM SULFUR-BEARING MATERIAL

Joseph E. Ritsko, and Howard L. Acla, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 1, 1983, Ser. No. 557,022

Int. Cl.³ C01G *39/00, 41/00*

U.S. Cl. 423—61 **4 Claims**

1. A process for recovering soluble tungsten, molybdenum and sulfur values from a sludge comprising from about 30 to about 60 percent free sulfur, from about 2 to about 10 percent by weight tungsten, and from about 2 to about 10 percent by weight molybdenum on a dry basis, said sludge being produced by adding sodium hydrosulfide to a digested tungsten ore solution to precipitate said sludge, said process comprising mixing said sludge with an aqueous solution of sodium carbon-

ate at a pH of about 10 to about 11, reacting said sludge with said sodium carbonate for a sufficient period of time to form a resulting reaction mixture of water soluble tungsten and molybdenum compounds comprising sodium tungstate, sodium thiotungstate, sodium molybdate and sodium thiomolybdate, adjusting the pH of said resulting reaction mixture to about 10 to about 11 with additional sodium carbonate, cooling the resulting reaction mixture to about 20° C. to about 25° C., oxidizing said reaction mixture with an excess of an oxidizing agent that is theoretically required to substantially convert said water soluble tungsten and molybdenum compounds to water soluble sodium tungstate and sodium molybdate and form another reaction mixture comprising a two-phase system of an aqueous phase and a solid phase wherein said tungstates and molybdates are in the aqueous phase and the sulfur values are in the solid phase, and separating said solid phase from said aqueous phase, said liquid phase contains from about 95% to about 98% of the tungsten and molybdenum in said sulfur bearing material.

4,482,527

PROCESS FOR REMOVING NITROGEN DIOXIDE FROM OFF-GAS

Klaus Lehr, Hürth, and Gero Heymer, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,130

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238423

Int. Cl.³ C01B *21/00*; B01J *8/00*

U.S. Cl. 423—235 **5 Claims**

1. A process for removing nitrogen dioxide from off-gas which consists essentially of intimately contacting the off-gas with an aqueous suspension of red phosphorus particles having particle sizes of up to 5 mm, with the resultant formation of a gaseous phase consisting essentially of nitrogen and traces of dinitrogen dioxide and a liquid phase comprising phosphorous acid and phosphoric acid.

4,482,528

LIME SLAKING AND GRIT REMOVAL PROCESS UTILIZED IN SO_2 REMOVAL

Robert C. Emmett, Salt Lake City, Utah, assignor to Envirotech Corporation, Salt Lake City, Utah

Filed Jan. 10, 1983, Ser. No. 456,923

Int. Cl.³ C01B *17/00, 13/14*; C01F *5/02, 11/02*

U.S. Cl. 423—242 **14 Claims**

1. A lime slaking and grit removal process comprising:

(a) reacting calcium oxide with water to form a viscous calcium hydroxide slurry, said calcium oxide containing a portion of +100 mesh grit;

(b) diluting said slurry with an upstream provided countercurrent diluent;

(c) centrifugally separating the grit from said diluted slurry, overflow from said separating step containing a major amount of said calcium hydroxide slurry as usable product;

(d) classifying underflow from step (c) while adding dilution water;

(e) utilizing overflow from said step (d) as the diluent in step (b); and

(f) removing settled grit resultant from step (d).

4,482,529

CATALYTIC HYDROLYSIS OF COS IN ACID GAS REMOVAL SOLVENTS

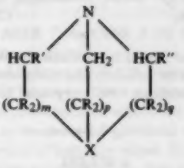
Michael S. Chen, Zionsville; James T. Edwards, Allentown, both of Pa., and William R. Ernst, Roswell, Ga., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 7, 1983, Ser. No. 456,222

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—243 **14 Claims**

1. A process for hydrolyzing COS present in a gas stream to H_2S and CO_2 comprising contacting said gas stream with an acid gas removal solvent, and adding a bicyclo tertiary amine in a concentration range of 0.02 to 8.0 g-mole/l to said acid gas removal solvent, said bicyclo tertiary amine having the general formula:



wherein X represents H—C or N; R and R′ represent H, CH_3 or C_2H_5—; R″ represents H or CH_3— only if R′ is not C_2H_5; and m, p and q≧1.

4,482,530

METHOD OF MAKING ZEOLITE Y

Robert N. Sanders, Baton Rouge, and Sebastian M. Laurent, Greenwell Springs, both of La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 29, 1982, Ser. No. 454,377

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **23 Claims**

1. A method of producing a crytalline synthetic faujasite of the zeolite "Y" type of a desired particle size, comprising the steps of separately preparing a sodium silicate solution and a sodium aluminate solution, providing an activated low water system comprising a sodium silicate solution with a seed amount up to about 10 percent by weight of the mixture of synthetic faujasite of the Zeolite "Y" type, mixing the sodium aluminate solution with the activated system over a period of up to about five hours to form a reaction mixture having the following molar ratios:

sodium oxide to silica—0.5:1 to 1:1,

silica to alumina—10:1 to 15:1, and

water to sodium oxide—17:1 to 30:1,

allowing the mixture to stand for up to about 24 hours at a temperature from about 0° C. to ambient, drying and particulating the resulting mixture to a Zeolite "Y" of a particle size of about 65 to 80 microns, slurrying the particles and then heating the mixture to a temperature of about 80° C.–120° C. until the desired crystalline synthetic faujasite of the Zeolite "Y" type is formed, and recovering said Zeolite "Y" of an average particle size range of about 65 to 80 microns.

4,482,531

SYNTHESIS OF ZSM-12 ZEOLITE

Guenter H. Kuehl, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1983, Ser. No. 490,082

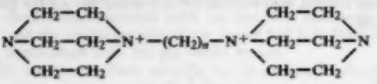
Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **8 Claims**

1. A process for preparing a siliceous porous crystalline ZSM-12 zeolite material having the X-ray diffraction pattern of Table II, which comprises preparing a reaction mixture comprised of sources of an alkali or alkaline earth metal, alumina, silica, RN^+ and water, and having the following composition, in terms of mole ratios of oxides:

OH^-/YO_2	=	0.10 to 0.40
$RN^+/(RN^+ + M)$	=	0.2 to 0.95
H_2O/OH^-	=	20 to 300
YO_2/W_2O_3	=	60 to 5000

wherein Y is silicon or germanium, $(RN)_2^{2+}$ is DABCO-C_n-diquat, having the formula:



wherein n is 4,5,6 or 10, M is an alkali or alkaline earth metal, and W is aluminum or gallium, and maintaining the mixture at crystallization conditions until crystals of said zeolite are formed.

4,482,532

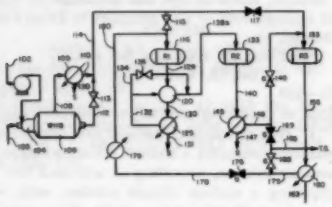
SYSTEM AND PROCESS FOR PRODUCING ELEMENTAL SULFUR

Boyd E. Cabanaw, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 29, 1983, Ser. No. 518,718

Int. Cl.³ C01B *17/04*

U.S. Cl. 423—574 R **11 Claims**



1. In a Cold Bed Adsorption process of the type including in the adsorption mode the steps of reacting acid gas and air in a thermal reaction zone, reacting the resulting gas in a plurality of catalytic reaction zones arranged in series and maintained at progressively reduced temperatures, the effluent from each reaction zone being cooled to recover sulfur and the gas being then heated to a desired temperature and fed to the subsequent reaction zone, at least one of said catalytic reaction zones being at intervals operated in an adsorption mode maintained below the dew point of sulfur, the improvement comprising:

reacting the resulting gas from the thermal reaction zone in three catalytic reaction zones arranged in series for the recovery of sulfur, two of the catalytic reaction zones maintained at temperatures above the sulfur dew point, and the third catalytic reaction zone being operated in the adsorption mode at temperatures below the sulfur dew point, sulfur being deposited on the catalyst; and

feeding during regeneration mode, the gas from the thermal reaction zone to the third catalytic reaction zone, maintained in the adsorption mode below the dew point of sulfur, to regenerate the catalyst and feeding the effluent therefrom through the two catalytic reaction zones maintained at temperatures above the sulfur dew point.

4,482,533

POLYMERIC DIFFUSION MATRIX CONTAINING PROPRANOLOL

Alec D. Keith, Miami, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 338,256, Jan. 11, 1982, abandoned. This application Mar. 28, 1983, Ser. No. 479,499

Int. Cl.³ A61L *15/03*; A61K *9/70*; A61F *13/00*

U.S. Cl. 421—28 **1 Claim**

1. A self-supporting polymeric diffusion matrix for the sustained release of propranolol in order to deliver said propranolol to a patient, said matrix comprising from about 1 to about 60% by weight of a polar plasticizer, from about 5 to about 20% by weight polyvinylalcohol having a molecular weight from about 50,000 to about 150,000, from about 10 to about 25% by weight polyvinylalcohol having a molecular weight from about 4,000 to about 15,000, from about 2 to about 30% by weight polyvinylpyrrolidone, a pharmaceutically effective amount of the propranolol to provide a sustained release of said propranolol over a prolonged period, and from about 5 to about 20% by weight of diethanol myristoylamide, effectively functioning to bring the components into solution, said matrix having been formed from said solution.

4,482,534

NITROGLYCERIN PREPARATIONS

Izhak Blank, Haifa, Israel, assignor to Forest Laboratories, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 325,833, Nov. 30 1981, abandoned.

Filed Aug. 18, 1983, Ser. No. 524,369

Claims priority, application Israel, Dec. 16, 1980, 61721

Int. Cl.³ A61L *15/03*; A61F *13/00*; A61K *9/70, 31/21*

U.S. Cl. 424—28 **28 Claims**

1. A composition for the sustained transdermal administration of nitroglycerin, comprising an ointment base or gel containing a mixture of nitroglycerin and a water-insoluble vinylpyrrolidone polymer selected from the group consisting of (a) crosslinked vinylpyrrolidone homopolymer, and (b) crosslinked or uncrosslinked copolymer containing at least 10% by weight vinylpyrrolidone, and wherein the nitroglycerin concentration is within the range of about 1% to about 6% of the total weight of the composition.

4,482,535

COSMETIC PREPARATION FOR TEETH

András Sugar, Törökvész u. 95-97, H-1025 Budapest, and Laszlo Fabry, Tartsay u. 28, H-1126 Budapest, both of Hungary

PCT No. PCT/HU81/00039, § 371 Date May 28, 1982, § 102(e) Date May 28, 1982, PCT Pub. No. WO82/01128, PCT Pub. Date Apr. 15, 1982

PCT Filed Oct. 2, 1981, Ser. No. 387,859

Claims priority, application Hungary, Oct. 3, 1980, 2423/80

Int. Cl.³ A61K *7/16, 31/74, 31/78*

U.S. Cl. 424—49 **1 Claim**

1. A method for improving the appearance of the teeth for only a brief period of time between several hours and several days which comprises the steps of:

(a) applying to the surface of a tooth a cosmetic tooth composition which consists essentially of:

(1) a first film-forming polymer, said film-forming polymer being emulsifiable and dispersible in water and consisting essentially of a methacrylic acid methyl ester-styrene mixture in a weight ratio of 90:10;

(2) a second film-formng polymer, said second film-forming polymer being water-soluble and consisting essentially of polyvinyl alcohol wherein the weight ratio between the first and second film-forming polymer is 100:0.5;

(3) a titanium dioxide coloring agent; and

(4) a nontoxic solvent selected from the group consisting of water, ethanol, and mixtures thereof;

(b) allowing the film layer to dry; and

(c) drawing off the film layer without rubbing after said brief period of time has elapsed.

4,482,536

EXTRUDABLE DENTAL CREAM

Harry Hayes, Thelwall; Anthony J. Morton, Ashton-Under-Lyne, and Kenneth Harvey, Wilmslow, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 479,528, Mar. 28, 1983, Pat. No. 4,444,747. This application Oct. 26, 1983, Ser. No. 545,568

Int. Cl.³ A61K *7/16, 7/18*

U.S. Cl. 424—52 **11 Claims**

1. A dental cream in a container therefor which dental cream

is smooth and free from extensional rheology during filling and upon extrusion including absence of formation of a tail comprising about 20–75% by weight of a polishing material, at least about half of which is hydrated alumina and about 20–80% by weight based on the weight of the dental cream of a liquid phase containing water, humectant or mixture thereof and about 0.5–5% by weight based on the weight of the dental cream of a gelling agent consisting essentially of hydroxyethyl cellulose having a viscosity in a range the average of which is at least about 24,000 cps, determined on a Brookfield viscometer in 2% by weight water:glycerine (1:1.56) solution at 20° C., with a No. 6 spindle at 20 rpm, wherein said dental cream is contained in a pressure differential dispensing container, a mechanically operated dispensing container or a dental cream tube.

4,482,537

SKIN CONDITIONING COMPOSITION

El-Sayed El-Menshawy, Holmdel, and Richard Dixon, Aberdeen, both of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,714

Int. Cl.³ A61K *7/15, 7/42, 7/44, 31/16*

U.S. Cl. 424—59 11 Claims

1. A non-greasy, non-cream, non-lotion skin conditioning and moisturizing composition in the form of a clear solution which upon application to skin forms a long-lasting skin-conditioning film, consisting essentially of hydrolyzed animal protein in an amount within the range of from about 0.01 to about 5% by weight, or a polyol selected from the group consisting of polyethylene glycol, sorbitol, glycerin, polyoxyethylene (26) glyceryl ether, propylene glycol, 1,3-butylene glycol, and hexylene glycol, said polyol being present in an amount within the range of from about 0.1 to about 10% by weight of said hydrolyzed animal protein and said polyol, water in an amount within the range of from about 10 to about 35% by weight, an astringent selected from the group consisting of ethanol, isopropyl alcohol and mixtures thereof in an amount within the range of from about 40 to about 90% by weight, a conditioning agent selected from the group consisting of allantoin, d-panthenol dl-panthenol and sodium 2-pyrrolidone carboxylic acid in an amount within the range of from about 0.01 to about 5% by weight; a preservative selected from the group consisting of imidazolidinyl urea, methyl paraben, propyl paraben, dimethyldimethoyl hydantoin, N-(3-chloroalkyl) hexaminium chloride, benzyl alcohol, phenoxyethanol and mixtures thereof in an amount within the range of from about 0 to about 1.5% by weight; from about 0 to about 1% by weight of a thickener selected from the group consisting of a cross-linked hydrophilic acrylic polymer, hydroxyethyl cellulose, hydroxypropyl cellulose and xanthan gum; one or more alkoxylated methyl glucose derivatives selected from the group consisting of polypropylene glycol methyl glucose ether and polyethylene glycol methyl glucose ether, in an amount within the range of from about 0.1 to about 4% by weight, and propylene glycol dicaprylate/dicaprate in an amount within the range of from about 0.05 to about 2.5% by weight, the alkoxylated methyl glucose derivative being present in a weight ratio to the propylene glycol dicaprylate/dicaprate of within the range of from about 5:1 to about 1:1, all of the above % by weight being based on the weight of the total composition.

4,482,538

NAIL VARNISH COMPOSITION CONTAINING NITROCELLULOSE, ABRASIVE PARTICLES AND COLLOIDAL SILICA

Aulette Davies, 45 Arend Ave., Randpark Ext. 5, Randburg, Transvaal, South Africa

Filed Apr. 16, 1982, Ser. No. 369,151

Claims priority, application South Africa, Apr. 16, 1981, 81/2562

Int. Cl.³ A61K *7/04*; C08K *3/36*; C08L *1/14*

U.S. Cl. 424—61 6 Claims

1. In a nail varnish for applying to human nails, the varnish comprising a liquid base which is a solution of a nitrocellulose in a solvent; the improvement in which the varnish contains an effective amount up to about 2.5 g/100 ml of abrasive particles having a particle size of less than about 30 microns, said abrasive particles being selected from the group consisting of diamond, cubic boron nitride, alumina, glass beads and mixtures thereof, said amount being effective to improve the wear resistance of the varnish, the varnish also containing colloidal silica in an amount effective to impart to said varnish properties of a Bingham plastic having a yield stress of not less than 0.2 Pa.

4,482,539

BETAMETHASONE DIPROPIONATE CREAM

Varda E. Sandweiss, Forest Hills, N.Y.; Elliot Stupak, and Paul H. Shapiro, both of West Caldwell, N.J., assignors to Schering Corporation, Madison, N.J.

Filed May 13, 1983, Ser. No. 494,214

Int. Cl.³ A61K *31/78*

U.S. Cl. 424—81 4 Claims

1. A topical pharmaceutical composition for the treatment of inflammation consisting essentially of 0.02 to 0.10 percent betamethasone dipropionate; 0.4 to 0.6 percent titanium dioxide; 1.0 to 2.5 percent Carbomer 940; sufficient base to adjust the pH to between pH 4.0 to pH 5.5; and about 60 to 80 percent of propylene glycol and about 20 to 40 percent water.

4,482,540

METHOD FOR TREATING HYPERCHOLESTEROLEMIA WITH ENDOMYCIN

Harry W. Gordon, Bronx, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Schmid Laboratories, Little Falls, N.J.

Continuation of Ser. No. 029,198, Apr. 12, 1979, Pat. No. 4,292,310, which is a division of Ser. No. 794,920, May 9, 1977, Pat. No. 4,163,050, which is a division of Ser. No. 521,289, Nov. 6, 1974, Pat. No. 4,039,659, which is a division of Ser. No. 177,512, Sep. 2, 1971, Pat. No. 3,855,409, and a continuation of Ser. No. 221,062, Jan. 26, 1972, Pat. No. 3,966,910, and a continuation of Ser. No. 24,797, Apr. 1, 1970, abandoned, which is a continuation of Ser. No. 627,313, Mar. 31, 1967, Pat. No. 3,627,879. This application Jun. 8, 1981, Ser. No. 271,566

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—116 3 Claims

1. A process for treating hypercholesterolemia in a large mammal which comprises orally administering an effective dose for treating hypercholesterolemia of endomycin to said mammal.

4,482,541
WATER SOLUBLE GLASS ARTICLES, THEIR MANUFACTURE, AND THEIR USE IN THE TREATMENT OF RUMINANT ANIMALS

Stewart B. Telfer; George Zervas, and Peter Knott, all of Leeds, England, assignors to University of Leeds Industrial Services Limited, England

Filed Feb. 23, 1983, Ser. No. 468,911

Claims priority, application United Kingdom, Feb. 23, 1982, 8205233

Int. Cl.³ A61K *33/42*

U.S. Cl. 424—128 **27 Claims**

1. A water soluble glass article in a form suitable for administration to a ruminant animal, the article containing:

(a) P_2O_5

(b) R_2O where R is chosen from Na, K and Li

(c) at least one other glass modifying or forming material

(d) at least one deficiency-rectifying element combined in the glass, said element being selected from Cu, Se, Co, Zn, I, Mn and Mg

in which:

when CuO is present in the glass the content of each of P_2O_5 and R_2O does not exceed 45 mol%;

when at least one of CuO and ZnO is present in the glass the sum of the quantities of P_2O_5 and R_2O is in the range of 56–76 mol%;

when CuO and ZnO are absent and at least one of MgO, CoO, SeO and I is present in the glass the sum of the quantities of P_2O_5 and R_2O is in the range of 56–92 mol%;

and the composition being such that when the glass article is present in the reticulo rumen of the animal the article has a release rate of not more than 25 mg per square centimeter of article surface area per day.

18. A method of forming a water-soluble glass article according to claim 1 comprising mixing as batch ingredients

(i) a compound selected from sodium metaphosphate and sodium hexametaphosphate

(ii) at least one other glass forming or modifying material

(ii) at least one material incorporating a deficiency-rectifying element selected from Cu, Se, Co, Zn, I, Mn and Mg,

heating the materials to a glass forming temperature and forming the glass composition into an article of the required physical form.

4,482,542
ANTACID MATERIAL BASED ON MAGNESIUM ALUMINIUM HYDROXIDE AND THE PREPARATION THEREOF

Michael Schneider, and Adolf Knecht, both of Freiburg, Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 260,859, May 6, 1981, abandoned. This application Jul. 12, 1983, Ser. No. 513,136

Claims priority, application Fed. Rep. of Germany, May 19, 1980, 3019032

Int. Cl.³ A61K *33/08*

U.S. Cl. 424—157 **9 Claims**

1. A process for the preparation of an antacid material based upon magnesium aluminum hydroxide, substantially free of sodium and carbonate ions, which comprises reacting a magnesium compound selected from the group of magnesium hydroxide, magnesium oxide, or mixtures thereof in an atomic ratio of magnesium to aluminum of 1:1 to 3:1 with an aqueous solution of aluminum sulphate until the pH of the reaction mixtures is from 4.0 to 8.01, then removing water-soluble components from the mixture and, isolating said antacid material.

4,482,543
BIOLOGICALLY ACTIVE SUBSTANCE, PROCESS FOR PREPARING THE SUBSTANCE AND IMMUNOACTIVE COMPOSITION

Naoyoshi Suzuki, Tokyo; Tsuneo Hirose, Obihiro, and Humio Osaki, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Factory, Inc., Naruto, Japan

Filed Feb. 17, 1982, Ser. No. 349,608

Claims priority, application Japan, Feb. 27, 1981, 56-28553; Feb. 27, 1981, 56-28554

Int. Cl.³ C07C *103/52*; A61K *37/02*

U.S. Cl. 424—177 **10 Claims**

1. A biologically active glycoprotein having a molecular weight of 3,000 to 5,000 as determined by a gel filtration method and has activity to inhibit toxoplasma multiplication not only in homologous cells but also in heterologous cells, and further has the following physical and chemical properties;

(a) solubility: freely soluble in water and practically incoluble in methanol, ethanol, ether, benzene, chloroform and acetone;

(b) ratio of sugar and protein contents: protein 85–90%, hexosamine 9–13% and hexose 1–2% calculated as glucose;

(c) constituent amino acid of protein portion: aspartic acid, threonine, serine, glutamic acid, glycine, alanine, cystine, valine, methionine, isoleucine, leucine, tyrosine, phenylalanine, lysine, tryptophan, histidine, arginine and proline;

(d) aspartic acid, glutamic acid and lysine contents in total amino acids: 45 to 65% by weight;

(e) pH: 7.0 to 7.2 (1 W/V % aqueous solution);

(f) thermal stability: when 1 W/V % aqueous solution of the substance is heated at 60±0.1° C. for 30 minutes, the solution still retains the immunoactivity to inhibit toxoplasma multiplication in homologous cells and heterologous cells;

(g) IR absorption: characteristic absorption at the following wave number (cm^{-1}); 3600–2900 (strong), 1700–1500 (strong), 1440–1380 (medium), 1160–1080 (medium), and 550 (medium);

(h) UV absorption: maximum absorption is found at 274–276 nm for 0.1 W/V % aqueous solution;

(i) color reaction; positive Lowry-Folin process, Ninhydrin reaction, Phenol-sulfuric acid reaction and Elson-Morgan's reaction;

(j) color and appearance: white and amorphous.

4,482,544
COMPOUNDS FOR TREATING HYPERTENSION

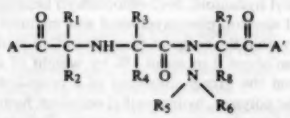
Fu-chih Huang, Boonton, N.J.; Howard Jones, Ossining, and Wan-Kit Chan, Yorktown Heights, both of N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Nov. 29, 1982, Ser. No. 445,117

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **17 Claims**

1. Compounds of the formula (I)



and their pharmaceutically-acceptable salts, wherein

A and A′ are independently hydroxy, alkoxy, alkenoxy, aryloxy, arylalkylamino, or hydroxyamino;

R_1, R_2, R_7, and R_8 are independently hydrogen, alkyl, aryl, aralkyl, fused cycloalkyl-aryl, fused aryl-cycloalkyl, aryloxyalkyl, or arylalkyloxyalkyl;

R_3 and R_4 are independently hydrogen, lower alkyl, lower alkenyl, lower alkynyl, aryl, fused cycloalkyl-aryl, fused aryl-cycloalkyl, fused cycloalkylaryl-alkyl, fused arylcycloalkyl-alkyl, aralkyl, cycloalkyl, or heterocyclic;

R_5 and R_6 are independently hydrogen, alkyl, alkenyl, alkynyl, acyl, cycloalkyl, cycloalkyl-alkyl, polycycloalkyl, polycycloalkyl-alkyl, aryl, aralkyl, fused cycloalkyl-aryl, fused arylcycloalkyl, fused aryl-cycloalkyl-alkyl, or fused cycloalkyl-aryl-alkyl;

wherein the alkyl, alkoxy, alkenoxy, alkenyl, and alkynyl groups may carry substituents selected from the group consisting of hydroxy, acyloxy, aryl, alkoxy, aryloxy, halo, amino, mono- or dialkylamino, acylamino, thio, and alkylmercapto; the cycloalkyl rings may include a hetero atom, may be saturated or unsaturated, and may carry substituents selected from the group consisting of alkyl, halo, haloalkyl, hydroxy, alkylamino, and nitro; and the aryl rings may contain a hetero atom and may carry substituents selected from the group consisting of carboxylic acid, cyano, carbo-lower alkoxy, alkyl, hydroxy, alkoxy, hydroxyalkyl, halo, haloalkyl, thio, alkylmercapto, thioalkyl, amino, alkylamino, aminoalkyl, nitro, methylenedioxy, and sulfonylamino;

wherein the alkyl groups contain 1 to 9 carbon atoms; and the cycloalkyl groups and the cycloalkyl portions of substituents containing cycloalkyl groups contain 3 to 9 carbon atoms.

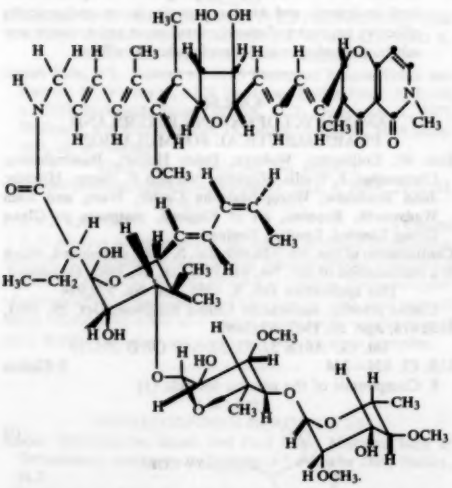
4,482,545

ISOEFROTOMYCIN, PROCESS OF PREPARATION, PHARMACEUTICAL COMPOSITION AND METHOD OF USING SAME

Richard J. Bochis, East Brunswick, and Ray S. Dewey, Martinsville, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 13, 1983, Ser. No. 541,804
Int. Cl.[3] A61K *31/71*; C07H *3/06*
U.S. Cl. 424—181 10 Claims

1. Isoefrotomycin having the following structure:



9. A method for combatting gram positive and gram negative bacterial infections which comprises contacting the area so infected with an effective amount of isoefrotomycin.

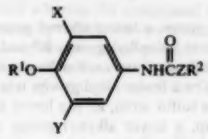
4,482,546

FUNGICIDAL N-PHENYLCARBAMATES

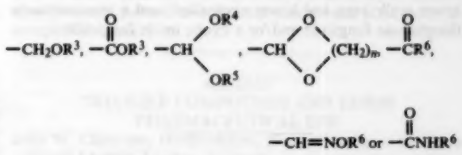
Junya Takahashi, Nishinomiya; Toshiro Kato, Takarazuka, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 12, 1982, Ser. No. 367,404
Claims priority, application Japan, Apr. 16, 1981, 56-58303; Nov. 6, 1981, 56-178509
Int. Cl.[3] A01N *57/30*, *47/10*; C07C *125/063*
U.S. Cl. 424—211 67 Claims

1. An N-phenylcarbamate of the formula:

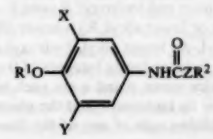


wherein X and Y, which may be the same or different, are each a halogen atom, a lower alkyl group, a lower alkenyl group, a lower cyanoalkenyl group, a lower alkynyl group, a lower alkoxy group, a cyano group, a lower alkyl group substituted with at least one member selected from the group consisting of halogen, hydroxyl and cyano, or a group of the formula:



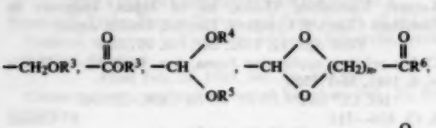
in which R^3 is a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a lower haloalkyl group, R^4 and R^5, which may be the same or different, are each a lower alkyl group, R^6 is a hydrogen atom or a lower alkyl group, n is 2, 3 or 4, Z is an oxygen atom or a sulfur atom, R^1 is a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a lower alkyl group substituted with at least one member selected from the group consisting of halogen, lower alkoxy and lower cycloalkyl and R^2 is a C_1–C_8 alkyl group, a C_3–C_8 alkenyl group, a C_3–C_8 alkynyl group, a lower cycloalkyl group, a lower haloalkenyl group, a lower haloalkynyl group or a lower alkyl group substituted with at least one member selected from the group consisting of halogen, cyano, lower alkoxy, lower alkenyloxy, lower haloalkoxy, phenoxy, lower aralkyloxy and lower cycloalkyl, with the proviso that ethyl N-(3,4,5-trimethoxy)phenylcarbamate, ethyl N-(3,4,5-triethoxy)phenylcarbamate 2-butynyl N-C3,4,5-trimethoxyphenyl)carbamate and propargyl N-(3,5-dibromo-4-methoxy)phenylcarbamate are not included and with the further proviso that when Z is sulfur and X and Y are each halogen, R_1 and R_2 are not both methyl.

67. A method for controlling plant pathogenic fungi which comprises applying a fungicidally effective amount of a mixture of the N-phenylcarbamate of the formula:



wherein X and Y, which may be the same or different, are each a halogen atom, a lower alkyl group, a lower alkenyl group, a lower cyanoalkenyl group, a lower alkynyl group, a lower

alkoxy group, a cyano group, a lower alkyl group substituted with at least one member selected from the group consisting of halogen, hydroxyl and cyano, or a group of the formula:



in which R^3 is a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a lower haloalkyl group, R^4 and R^5, which may be the same or different, are each a lower alkyl group, R^6 is a hydrogen atom or a lower alkyl group, n is 2, 3 or 4, Z is an oxygen atom or a sulfur atom, R^1 is a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a lower alkyl group substituted with at least one member selected from the group consisting of halogen, lower alkoxy and lower cycloalkyl and R^2 is a C_1–C_8 alkyl group, a C_3–C_8 alkenyl group, a C_3–C_8 alkynyl group, a lower cycloalkyl group, a lower haloalkenyl group, a lower haloalkynyl group or a lower alkyl group substituted with at least one member selected from the group consisting of halogen, cyano, lower alkoxy, lower alkenyloxy, lower haloalkoxy group, phenoxy, lower aralkyloxy and lower cycloalkyl, and a benzimidazole thiophanate fungicide and/or a cyclic imide fungicide.

4,482,547

SUBSTITUTED-1,3,4-BENZOTRIAZEPINES

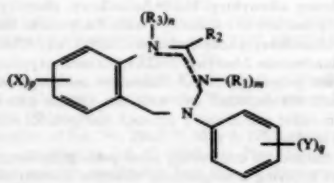
Lawrence L. Martin, Lebanon, and Linda L. Setescak, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Sommerville, N.J.

Filed Aug. 26, 1982, Ser. No. 412,047

Int. Cl.³ A61K *31/55*; C07D *255/04*

U.S. Cl. 424—244 **25 Claims**

1. A compound having the formula



wherein X and Y are each independently hydrogen, lower alkyl, halogen, lower alkoxy, nitro and hydroxyl; R_1 and R_3 are each independently hydrogen or lower alkyl; R_2 is lower alkyl, cycloalkyl lower alkyl, phenyl, Ar lower alkyl, hydroxyl and sulfhydryl; m and n are each independently integers of 0 or 1 and when m is 0, n is 1 and vice-versa, p and q are each independently integers of 1 or 2 or its tautomers; and the pharmaceutically acceptable acid addition salts of any of the foregoing.

18. A method of reducing blood pressure in mammals comprising administering to a mammal a blood pressure reducing effective amount of a compound of any one of claims **1–16**.

4,482,548

ANALGESIC PHARMACEUTICAL COMPOSITIONS CONTAINING 5-PHENYL-1,4-BENZO DIAZEPINE COMPOUNDS AND A METHOD OF USING SAME

Dietmar Roemer, Allschwil, Switzerland; Michael Ruhland; Horst Zeugner, both of Hanover, Fed. Rep. of Germany; Wolfgang Milkowski, Burgdorf, Fed. Rep. of Germany, and Hans Liepmann, Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, United Kingdom

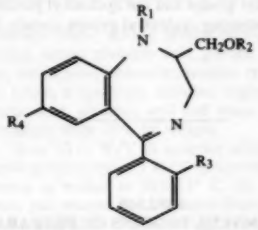
Filed May 16, 1983, Ser. No. 494,645

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221402

Int. Cl.³ A61K *31/33*

U.S. Cl. 424—244 **8 Claims**

1. A method of treating pain in humans and warm-blooded animals, comprising the step of administering to said human or said warm-blooded animal a pharmaceutical composition having high analgesic activity and including an analgesic agent comprising a 5-phenyl-1H-2,3-dihydro-1,4-benzodiazepine compound of the following Formula I



I

in which

R_1 represents a substituent selected from the group consisting of hydrogen and lower alkyl,

R_2 represents a substituent selected from the group consisting of hydrogen, lower alkyl, and lower alkanoyl,

R_3 represents a substituent selected from the group consisting of hydrogen and halogen, and

R_4 represents halogen, or a physiologically compatible acid addition salt of said compounds together with pharmaceutical excipients and binding agents, in an analgesically effective amount sufficiently small so as not to cause any substantial sedative and muscle relaxing effects.

4,482,549

AMINOCYCLOPENTANE ESTERS AND PHARMACEUTICAL FORMULATION

Eric W. Collington, Welwyn; Peter Hallett, Bassingbourn; Christopher J. Wallis, Royston; Norman F. Hayes, Hitchin; John Bradshaw, Ware; Malcolm Carter, Ware, and Alan Wadsworth, Royston, all of England, assignors to Glaxo Group Limited, London, England

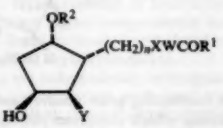
Continuation of Ser. No. 510,969, Jul. 5, 1983, abandoned, which is a continuation of Ser. No. 418,976, Sep. 16, 1982, abandoned. This application Feb. 8, 1984, Ser. No. 578,014

Claims priority, application United Kingdom, Oct. 29, 1981, 8132675; Apr. 29, 1982, 8212489

Int. Cl.³ A61K *31/55, 31/535*; C07D *295/14*

U.S. Cl. 424—244 **9 Claims**

1. Compounds of the general formula (1)



(1)

wherein R^1 is

(a) $-AR^3$ where A is —O— or —S— and R^3 is phenyl $-CO_2R^4$, $-NHCOR^4$, $-CONR^5R^6$

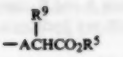
(b) $-OCH_2COR^7$ where R^7 is phenyl or $-NH_2$;

(c) $-A(CH_2)_mBR^5$ where m is 1–3 and B is —O— or —S—, provided that when m is 1, R^5 is not a hydrogen atom;

(d) $-A(CH_2)_pR^8$ where p is 2 or 3 and R^8 is an N-attached C_{1-4} dialkylamino, morpholino, piperidino, pyrrolidino, acetylamino or benzoylamino group;

(e) $-OCH(CH_2N(CH_3)_2)_2$

(f)



where R^9 is a hydrogen atom, methyl or phenyl;

(g) $-OCH_2OCOR^{10}$ where R^{10} is C_{1-4} alkyl, methoxy or phenyl;

(h) $-OCH_2SCOR^{11}$ wherein R^{11} is C_{1-4} alkyl;

(i) pyridinyloxy or pyridinylthio;

(j) 1-(acetyloxy)ethoxy, (acetyloxy)phenylmethoxy, tetrahydro-5-oxo-2-furanyloxy, tetrahydro-2-oxo-3-furanyloxy, triphenylmethoxy or diphenylmethoxy; or

(k) $-OR^{12}$ where R^{12} is C_{3-6} alkenyl, C_{5-7} cycloalkyl, $-CH_2CCl_3$ or furanylmethyl;

n is 1 or 2;

W is straight or branched C_{1-7} alkylene;

X is cis or trans —CH=CH— or $-CH_2CH_2-$;

Y is a saturated heterocyclic amino group which has 5–8 ring members and (a) optionally contains in the ring —O—, —S—, $-SO_2-$, or NR^{13}; and (b) is optionally substituted by one or more C_{1-4} alkyl groups;

R^2 is (i) straight or branched C_{1-5} alkyl substituted by (a) phenyl, (b) thienyl, or (c) naphthyl, or (ii) cinnamyl;

and the physiologically acceptable salts and solvates thereof.

9. A pharmaceutical composition comprising a compound as claimed in claim 1 and one or more pharmaceutical carriers.

4,482,550

FODDER AND FODDER ADDITIVES PROMOTING THE WEIGHT INCREASE OF DOMESTIC ANIMALS AND A PROCESS FOR THE USE THEREOF

Istvan Pais, 8/b, Frakno u., 1115 Budapest; Magda Feher nee Ravasz, 27, Vercse u., 1124 Budapest; Balint Nagy, 5, Ervin u., 1026 Budapest; Jozsef Bokori, 31/b, Damjanics u., 1071 Budapest, and Zoltan Szabo, 19, Dozsa Gyorgy ut, 1038 Budapest, all of Hungary

Filed Aug. 3, 1982, Ser. No. 404,921

Claims priority, application Hungary, Aug. 4, 1981, 2261/81

Int. Cl.³ A61K *31/55*

U.S. Cl. 424—245 **3 Claims**

1. A process for promoting the weight increase of domestic animals, comprising feeding to said animals fodder containing a small but effective amount of a water-soluble, stable complex of tetravalent titanium formed with ascorbic acid, said amount being effective to make said animals gain more weight than if fed a fodder that does not contain a said titanium complex.

4,482,551

CEPHALOSPORIN DERIVATIVES

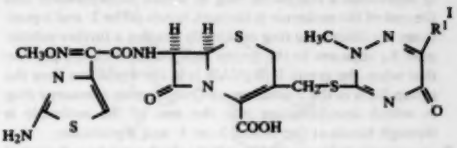
André Furlenmeier, Basel, and Paul Lanz, Muttenz, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 163,114, Jun. 26, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,951

Int. Cl.³ A61K *31/545*; **C07D** *501/56*

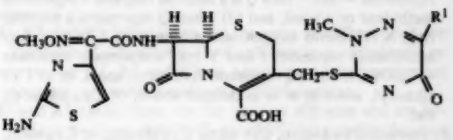
U.S. Cl. 424—246 **4 Claims**

1. A compound of the formula



wherein R^1 is hydrogen and the salts thereof and hydrates thereof wherein the compound is in the syn-isomeric form or mixtures in which the syn-isomeric form predominates.

4. A pharmaceutical preparation for the treatment and prophylaxis of infectious diseases, which comprises an effective amount of a compound of the formula



wherein R^1 represents hydrogen or a readily hydrolysable ester or a salt thereof or a hydrate thereof and a medicinally compatible carrier.

4,482,552

TRIAZOLE COMPOUNDS AND THEIR PHARMACEUTICAL USE

John W. Clitherow, Hertfordshire, England, assignor to Glaxo Group Limited, London, England

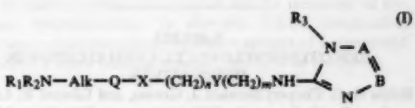
Filed Feb. 24, 1983, Ser. No. 469,233

Claims priority, application United Kingdom, Feb. 26, 1982, 8205723

Int. Cl.³ A61K *31/41*; **C07D** *403/12, 403/14*

U.S. Cl. 424—246 **10 Claims**

1. A compound of formula (I)



(I)

or a physiologically acceptable salt or hydrate thereof, in which

R_1 represents hydrogen, C_{1-14} alkyl, C_{3-8} cycloalkyl, C_{3-6} alkenyl, ar C_{1-6} alkyl wherein ar is phenyl or phenyl substituted with one or more C_{1-3} alkyl or C_{1-3} alkoxy groups or halogen atoms; heteroaralkyl wherein the heteroaryl portion is a thienyl, pyridinyl or furyl, the heteroaryl ring may be unsubstituted or substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy, hydroxy C_{1-6} alkyl, amino C_{1-6} alkyl, C_{1-6} alkylamino C_{1-6} alkyl, di-C_{1-6} alkylamino C_{1-6} alkyl or halogen, and the alkyl portion of the heteroalkyl group is a straight or branched C_{1-4} alkyl chain and theheteroaryl portion is linked to the alkyl portion through a carbon atom; trifluoro C_{1-6} alkyl or C_{1-6} alkyl substituted by hydroxy, C_{1-6} alkoxy, amino, C_{1-6} alkylamino, di-C_{1-6} alkylamino or C_{3-8} cycloalkyl; and R_2 represents hydrogen or C_{1-4} alkyl; or R_1 and R_2 may together with the nitrogen atom to which they are attached form piperidino, pyrrolidino, morpholino, 4-methylpiperidino, hexamethyleneimino tetrahydropyridino;

Alk represents a straight or branched alkylene chain of 1 to 3 carbon atoms,

Q represents a furan or thiophene ring in which incorporation into the rest of the molecule is through bonds at the 2- and 5-positions, the furan or thiophene ring optionally bearing a

further substituent R_4 adjacent to the group R_1R_2N-Alk-; or Q represents a thiophene ring in which incorporation into the rest of the molecule is through bonds at the 2- and 4-positions, the thiophene ring optionally bearing a further substituent R_4 adjacent to the group R_1R_2NAlk with the proviso that when the group R_1R_2NAlk is in the 4-position then the group R_4 is in the 5-position; or Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1- and 3- or 1- and 4-positions;

R_4 represents halogen or C_{1-4} alkyl which may be substituted by hydroxy or C_{1-4} alkoxy;

X represents oxygen, sulphur, —NH—, methylene or a bond;

Y represents oxygen, sulphur, methylene or a bond;

n represents zero, 1, 2 or 3, and m is an integer from 2 to 5, with the provisos that (a) the total number of atoms in te chain $X(CH_2)_nY(CH_2)_m$ is an integer from 3 to 8, (b) when X and Y represent oxygen or sulphur then n is 2 or 3, (c) when X represents —NH— then Q is a benzene ring and Y represents methylene or a bond, and (d) when Q represents a benzene ring, X represents oxygen, and n represents 1, then m may additionally represent 1 and Y may additionally represent $—CHOR_6$ where R_6 represents hydrogen, aroyl, or ar C_{2-7} alkanoyl, wherein ar is as defined above, or C_{1-6} alkanoyl; and

R_3 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, ar C_{1-6} alkyl, wherein ar is as defined above, or C_{2-6} alkyl substituted by hydroxy or C_{1-6} alkoxy;

either A represents N and B represents CR_5; or A represents CR_5 and B represents N; and R_5 represents

an ar C_{1-6} alkyl, wherein ar is as defined above or heteroar C_{1-6} alkyl group, wherein the heteroaryl portion is thienyl, pyridinal or furyl, and optionally substituted by a C_{1-3} alkyl group, with the alkyl portion of the group linked to the heteroaryl portion through a carbon atom, and in which the alkyl group of the ar C_{1-6} alkyl and heteroar C_{1-6} alkyl groups is substituted by hydroxy, C_{1-6} alkoxy, aroyloxy or ar C_{2-7} alkanoyloxy wherein ar is as defined above, or C_{1-6} alkanoyloxy.

10. A method of treating a condition mediated through H_2-receptors which comprises administering to a patient an effective amount of a compound according to claim **1** to relieve said condition.

4,482,553

BENZOTHIENYLGLYCYL CEPHALOSPORIN DERIVATIVES

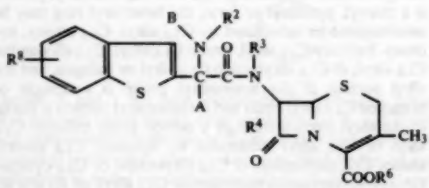
Robin D. G. Cooper; Bernard J. Graves, and Edward R. Lavagnino, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1983, Ser. No. 484,126

Int. Cl.³ A61K *31/545;* **C07D** *501/22, 501/57*

U.S. Cl. 424—246 **20 Claims**

1. A compound of the formula



wherein:

R^8 is halo;

A and B both are hydrogen, or taken together complete a double bond;

R^2 is hydrogen, an amino protecting group, hydroxy, or methoxy, and R^3 is hydrogen, or R^2 and R^3 taken together are

where

M and N independently are C_1–C_4 alkyl;

R^4 is hydrogen, methoxy or methylthio;

R^6 is hydrogen, a salt forming cation group, or a carboxy protecting group; and the pharmaceutically acceptable acid addition salts thereof; provided that R^2 is hydroxy or methoxy only when A and B complete a double bond, and that A and B both are hydrogen when R^3 is other than hydrogen.

17. A pharmaceutical formulation comprising an antibacterially effective amount of a compound of claim **1** admixed with a pharmaceutical carrier, diluent or excipient.

4,482,554

PHARMACEUTICAL COMPOSITIONS CONTAINING OXICAM DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Uwe Gebhardt; Helmut Augart, both of Waldkirch, and Adolf Knecht, Freiburg, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

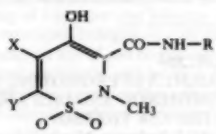
Filed Apr. 27, 1983, Ser. No. 488,922

Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217315

Int. Cl.³ A61K *31/54*

U.S. Cl. 424—246 **8 Claims**

1. A pharmaceutical composition comprising an aqueous solution containing at least one oxicam derivative of the general formula:



in which R is a pyridine or 5-methyl-3-isoxazole ring and X together with Y represent a condensed aromatic ring, together with 1.2 to 2 moles per mole of oxicam derivative of a base of general formula:

$$R—NH—CH_2—(CHOH)_n—CH_2OH$$

in which R is a hydrogen atom or an alkyl radical containing up to 6 carbon atoms and n is 3 or 4.

4,482,555

SUBSTITUTED 1H-PYRAZOLO (1,5-a) PYRIMIDINES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria, Milan; Carlo Passarotti, Gallarate, and Ada Buttinoni, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

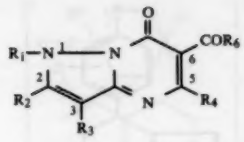
Filed Mar. 10, 1983, Ser. No. 474,205

Claims priority, application United Kingdom, Mar. 16, 1982, 8207637; Feb. 4, 1983, 8303089

Int. Cl.³ C07D *487/04;* **A61K** *31/495, 31/41*

U.S. Cl. 424—248.4 **10 Claims**

1. A compound of the formula (I)



(I)

wherein

R_1 is (a) a 2-pyridyl, 3-pyridyl or 4-pyridyl group; (b) a phenyl ring, unsubstituted or substituted by one or two groups chosen from halogen, trihalo-C_1–C_4 alkyl, C_1–C_6 alkyl, nitro, amino and C_2–C_6 alkanoylamino; (c) benzyl; or (d) C_1–C_6 alkyl;

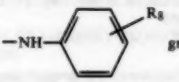
each of R_2 and R_3 independently is a hydrogen or a halogen atom or C_1–C_6 alkyl;

R_4 is hydrogen, C_1–C_6 alkyl or phenyl;

R_5 is (a')

wherein each of R_6 and R_7 independently is hydrogen or C_1–C_6 alkyl, or R_6 and R_7, taken together with the nitrogen atom to which they are linked, form a morpholino, piperidino, N-pyrrolidinyl or N-piperazinyl ring, wherein the N-piperazinyl ring is unsubstituted or substituted by C_1–C_6 alkyl;

(b')

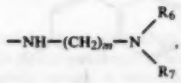


group,

wherein R_8 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen;

(c') —NHR_9, wherein R_9 is a 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidinyl, 2-pyrazinyl, 3-pyrazolyl, 2-thiazolyl or 2-benzothiazolyl group, each of these groups being unsubstituted or substituted by one or two groups chosen from halogen, C_1–C_6 alkyl, phenyl, hydroxy and C_1–C_6 alkoxy;

(d')



wherein m is 1, 2 or 3 and

R_6 and R_7 are as defined above; or the pharmaceutically acceptable salts thereof.

4,482,556

PYRIMIDO (6,1-A)ISOQUINOLIN-4-ONE DERIVATIVES

Bansi Lal; Horst Dornauer; Bani K. Bhattacharya; Alihussein N. Dohadwalla, and Noel J. de Souza, all of Bombay, India, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

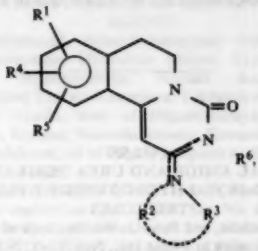
Continuation-in-part of Ser. No. 848,289, Nov. 3, 1977, abandoned. This application Mar. 26, 1980, Ser. No. 134,080

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720085

Int. Cl.[3] **A61K** *31/505;* **C07D** *471/04*

U.S. Cl. 424—251 **13 Claims**

1. A compound of the formula



an acid addition salt thereof with an inorganic or organic acid, or a quaternary ammonium salt thereof formed by reaction with an alkyl halide,

wherein

R^1, R^4, and R^5, taken alone, are the same or different and are hydrogen, C_1–C_3 alkoxy, C_1–C_6 alkanoyloxy, or halogen, or any two of R^1, R^4 and R^5, in adjacent positions and taken together, are methylenedioxy or ethylenedioxy;

R^2 and R^3, taken alone, are the same or different and are hydrogen, hydroxy, amino, C_1–C_6 alkyl substituted by furyl or tetra-hydrofuryl, C_1–C_6 alkyl, C_1–C_6 hydroxyalkyl, di(C_1–C_3 alkoxy) C_1–C_6 alkyl, halo-C_1–C_6 alkyl, di(C_1–C_4 alkyl-)amino C_1–C_6 alkyl, phenyl-C_1–C_2 alkyl, or phenyl-C_1–C_2 alkyl wherein the phenyl is mono-, di-, or tri-substituted with C_1–C_3 alkoxy, C_1–C_6 alkanoyl, unsubstituted phenyl or by phenyl mono- or poly-substituted with C_1–C_3 alkoxy, C_1–C_3 alkyl, halogen, or trifluoromethyl, or

R^2 and R^3, taken together with the nitrogen atom to which they are attached, are morpholino or piperizino or morpholino or piperizino substituted with C_1–C_6 alkyl, piperidino, phenyl, or phenyl substituted with C_1–C_3 alkoxy or by trifluoromethyl; and

R^6 is hydrogen, C_1–C_6 alkyl, di-(C_1–C_4 alkyl) amino-C_1–C_6 alkyl, or di-(C_1–C_6 alkyl)-phosphinyl-C_1–C_3 alkyl; but

if R^6 is defined as above, then R^2 represents an electron pair and if R^2 is defined as above, then R^6 represents an electron pair.

12. A pharmaceutical composition for the treatment of hypertonia, bronchospasms, or allergies, which composition comprises a pharmaceutically effective amount of a compound as in claim 1 and a pharmaceutically acceptable excipient.

4,482,557

3-SUBSTITUTED-2-OXO-TETRAHYDRO-PYRROL[1,2,a] PYRIMIDINES HAVING DIGITALIS-LIKE ACTIVITY

Jozsef Kokosi, Budaörs; Istvan Hermecz, Budapest; Zoltan Meszaros, Budapest; Gyorgy Szasz, Budapest; Lelle Vasvari nee Debreczy, Budapest; Agnes Horvath, Budapest, and Tibor Breining, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

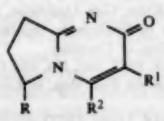
Continuation-in-part of Ser. No. 148,239, May 9, 1980, Pat. No. 4,367,229. This application Sep. 9, 1982, Ser. No. 416,130

Claims priority, application Hungary, May 11, 1979, CI-1930

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/505*

U.S. Cl. 424—251 **4 Claims**

1. A compound of the formula (II)



(II)

or a pharmaceutically acceptable acid addition or lower alkyl, phenyl, or lower alkyl-phenyl quaternary ammonium salt

thereof, wherein R is hydrogen or lower alkyl; R^1 is carboxyl or lower alkoxycarbonyl and R^2 is hydrogen or lower alkyl.

4,482,558

ANTIFUNGAL AMIDE AND UREA DERIVATIVES OF (3-AMINO-2-ARYL-2-HYDROXYPROP-1-YL)-1H-1,2,4-TRIAZOLES

Kenneth Richardson, and Peter J. Whittle, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

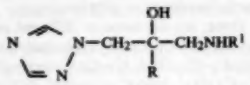
Filed Jun. 3, 1983, Ser. No. 500,748

Claims priority, application United Kingdom, Jun. 18, 1982, 8217721

Int. Cl.[3] **A01N** *43/64*; **C07D** *249/08, 401/12, 403/12*

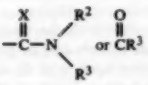
U.S. Cl. 424—251 **12 Claims**

1. A compound of the formula



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein R is 2,4-dichlorophenyl and R^1 is



where X is O or S, R^2 is H, or C_1–C_4 alkyl and R^3 is H, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, $R^4R^5C_6H_3(CH_2)_n$ or Het, and n is zero or one, R^4 and R^5 are independently H, chloro, or CF_3 and Het is pyridyl, pyrimidinyl or pyrazinyl, each being optionally monosubstituted or disubstituted by chloro, CF_3 or hydroxy, or when taken together with the nitrogen atom to which they are attached R^2 and R^3 are 1-pyrrolidinyl or piperidino.

9. A pharmaceutical composition comprising an antifungal amount of a compound according to claim 1 and a pharmaceutically acceptable diluent or carrier.

10. An agricultural antifungal composition suitable for use on a plant or seed which comprises an antifungal amount of a compound according to claim 1 and an agriculturally acceptable diluent or carrier.

4,482,559

4-PHENYL-4,5,6,7-TETRAHYDRO-THIENO [2,3-c]PYRIDINES, COMPOSITIONS AND USE

Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen; Karl-Heinz Weber, Gau-Algesheim; Wolf D. Bechtel, Appenheim, and Karin Böke-Kuhn, Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

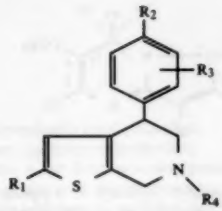
Filed Feb. 14, 1983, Ser. No. 466,100

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207939

Int. Cl.[3] **A61K** *31/44*; **C07D** *495/04*

U.S. Cl. 424—256 **4 Claims**

1. A compound of the formula



wherein

R_1 is hydroxymethyl,

R_2 and R_3 are each hydrogen, fluorine, chlorine, bromine, trifluoromethyl, hydroxyl, methoxy, methyl or ethyl;

R_4 is straight or branched alkyl of 1 to 3 carbon atoms, or a non-toxic, pharmacologically acceptable salt thereof.

3. An antidepressant pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antidepressant amount of a compound of claim 1.

4,482,560

CARBOSTYRIL DERIVATIVES, AND ANTIHISTAMINIC AGENTS CONTAINING THE SAME

Kazuo Banno; Takafumi Fujioka; Yasuo Oshiro, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

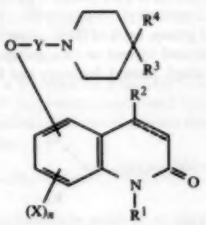
Continuation-in-part of Ser. No. 327,460, Dec. 4, 1981, abandoned, which is a continuation of Ser. No. 186,340, Sep. 11, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,769

Claims priority, application Japan, Sep. 18, 1979, 54-120452; Sep. 28, 1979, 54-125565

Int. Cl.[3] **A61K** *31/47*; **C07D** *215/22, 215/26*

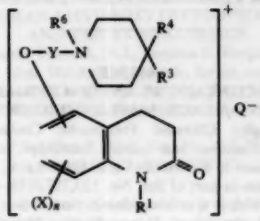
U.S. Cl. 424—258 **24 Claims**

1. A carbostyril derivative or a pharmaceutically acceptable salt thereof, said carbostyril derivative being represented by the general formula (1),



(1)

wherein R^1 is a hydrogen atom, a lower alkenyl group, a lower alkynyl group or a lower alkyl group which may have phenyl group(s) as the substituted group(s); R^2 is a hydrogen atom, a lower alkyl group or a phenyl group; R^3 is a lower alkyl group having phenyl group(s) as the substituted group(s), or a phenyl group which may have 1 to 3 substituted groups selected from the group consisting of halogen atoms, lower alkyl groups and lower alkoxy groups; R^4 is a hydrogen atom, a hydroxyl group or a lower alkanoyl group; X is a halogen atom; Y is a lower alkylene group which may have hydroxyl group(s) as the substituent(s); n is 0, 1 or 2; the carbon-carbon bond between 3- and 4-positions in the carbostyril skeleton is a single or double bond; provided that when R^3 is a lower alkyl group having phenyl group(s) as the substituted group(s) then R^4 should be neither a hydroxyl group nor a lower alkanoyl group, or a quaternary salt represented by the general formula (1e),



wherein R^1, R^2, R^3, R^4, Y, n and the carbon-carbon bond between 3- and 4-positions in the carbostyril skeleton are the same as defined above, R^6 is a lower alkyl group and Q is a halogen atom.

24. An antihistaminic agent containing an antihistaminically effective amount of at least one carbostyril derivative or pharmaceutically acceptable salt thereof or quaternary salt of claim **1** as the active ingredient.

4,482,561

THERAPEUTICALLY EFFECTIVE PIPERIDYL N-(4-QUINOLYL)-ANTHRANILOYLOXYALKANOATES

Dante Nardi; Gianni Motta; Rodolfo Testa, and Gabriele Graziani, all of Milan, Italy, assignors to Recordati, S. A., Chemical & Pharmaceutical Co., Chiasso, Switzerland

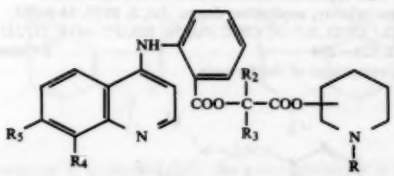
Filed Nov. 12, 1982, Ser. No. 441,093

Claims priority, application United Kingdom, Nov. 14, 1981, 8134398

Int. Cl.[3] **A61K** *31/47; C07D 215/44*

U.S. Cl. 424—258 **15 Claims**

1. A compound having the structural formula (I):



(I)

in which R is a straight or branched chain alkyl radical having form 1 to 4 carbon atoms; an alkenyl or alkynyl radical having from 2 to 6 carbon atoms; a benzyl, phenethyl, 4-nitrophenethyl or 4-aminophenethyl radical; or a phenacyl, benzoylethyl, β-hydroxyphenethyl or α-hydroxyphenylpropyl radical, optionally substituted on the phenyl ring by one or more halogen atom, trifluoromethyl, nitro or amino substituents, or an alkyl or alkoxy substituent having from 1 to 4 carbon atoms; R_1 is a hydrogen atom or a phenyl radical; each of R_2 and R_3 is independently a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms; one of R_4 and R_5 is a chlorine atom or a trifluoromethyl radical and the other of R_4 and R_5 is a hydrogen atom; and the pharmaceutically acceptable salts thereof.

14. The method for eliciting an analgesic, anti-inflammatory, antidepressant or platelet aggregation inhibiting response in a warm-blooded animal, comprising administering to a warm-blooded animal in need of such treatment, a therapeutically effective amount of the compound as defined by claim **1**, or pharmaceutically effective salt thereof.

4,482,562

AROMATIC AMINOETHANOL COMPOUNDS, AND UTILIZATION THEREOF AS CARDIOVASCULAR AGENTS

Masami Shiratsuchi, Musashimurayama; Noboru Shimizu, Higashimurayama; Hiromichi Shigyo, Fuchu; Yoshinori Kyotani, Higashiyamato; Hisashi Kunieda, Higashimurayama; Kiyoshi Kawamura, Tokorozawa; Seiichi Sato; Toshihiro Akashi, both of Higashimurayama; Masahiko Nagakura, Sayama; Naotoshi Sawada, Kawasaki, and Yasumi Uchida, Ichikawa, all of Japan, assignors to Kowa Company, Ltd., Aichi, Japan

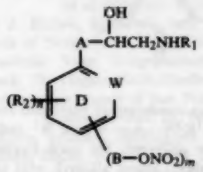
Division of Ser. No. 233,643, Feb. 11, 1981, Pat. No. 4,374,840. This application Sep. 3, 1982, Ser. No. 414,819

Claims priority, application Japan, Feb. 13, 1980, 55-15433

Int. Cl.[3] **A61K** *31/44, 31/135;* **C07D** *213/74*

U.S. Cl. 424—263 **9 Claims**

1. A compound represented by the following formula



wherein

A represents a direct bond,

B represents a C_1–C_{11} alkylene group bonded to a carbon atom of the aromatic ring D either directly or through —O—,

W represents a carbon or nitrogen atom,

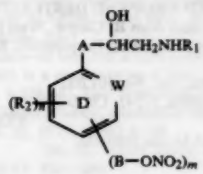
R_1 represents a C_3–C_7 alkyl group, a hydroxy-C_1–C_6 alkyl group, or a phenyl- or diphenyl-alkyl group with the alkyl group having 1 to 4 carbon atoms,

R_2 represents a member selected from the group consisting of hydrogen, halogen, OH, C_1–C_4 alkyl, nitro, C_1–C_4 alkoxy, acetyl, allyloxy, and when two or more R_2 groups exist, they may be identical or different, and

n represents 1 or 2 and m represents 1 or 2; and

a pharmaceutically acceptable acid addition salt thereof.

2. A pharmaceutical composition comprising an amount, effective for treatment of diseases of angina, hypertension or arrhythmia of a compound or a pharmaceutically acceptable acid addition salt thereof, said compound represented by the following formula:



wherein

A represents a direct bond,

B represents a C_1–C_{11} alkylene group bonded to a carbon atom of the aromatic ring D either directly or through —O—,

W represents a carbon or nitrogen atom,

R_1 represents a C_3–C_7 alkyl group, a hydroxy-C_1–C_6 alkyl group, or a phenyl- or diphenyl-alkyl group with the alkyl group having 1 to 4 carbon atoms,

R_2 represents a member selected from the group consisting of hydrogen, halogen, OH, C_1–C_4 alkyl, nitro, C_1–C_4 alkoxy, acetyl, allyloxy and when two or more R_2 groups exist, they may be identical or different, and

n represents 1 or 2 and m represents 1 or 2; and a pharmaceutically acceptable diluent or carrier therefor.

4,482,563

NITRO PYRROLS AND THEIR PHARMACEUTICAL USE

Michael L. Roantree, Welwyn Garden City, and Rodney C. Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

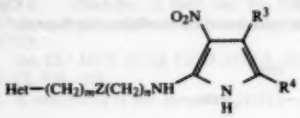
Division of Ser. No. 343,632, Jan. 28, 1982, Pat. No. 4,407,808, which is a division of Ser. No. 159,524, Jun. 16, 1980, Pat. No. 4,331,668, which is a division of Ser. No. 043,786, May 30, 1979, Pat. No. 4,238,494. This application Jun. 27, 1983, Ser. No. 507,814

Claims priority, application United Kingdom, May 30, 1978, 24117/78; Aug. 4, 1978, 32313/78

Int. Cl.³ A61K *31/40, 31/41;* C07D *403/12, 413/12*

U.S. Cl. 424—267 5 Claims

1. A compound represented by Structure 1:



Structure 1

in which

Het is selected from the group consisting of furyl and thienyl substituted by a group R^1R^2N—A— where R^1 and R^2, which can be the same or different, are each hydrogen, lower alkyl, C_3–C_6 cycloalkyl, lower alkenyl, aryl lower alkyl, lower alkyl substituted by lower alkoxy, (lower alkyl-)amino or di(lower alkyl)amino or R^1 and R^2 together with the nitrogen atom to which they are attached form a pyrrolidino or piperidino ring, and A is a straight or branched C_1–C_6 alkanediyl group;

Z is sulphur, methylene or oxygen;

m is 0, 1 or 2 and n is 2 or 3 provided that m+n is 3 or 4;

R^3 is hydrogen, lower alkyl, aryl, aryl lower alkyl or heteroaryl lower alkyl; and

R^4 is hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof,

wherein aryl is phenyl optionally substituted by lower alkyl, lower alkoxy or halogen and heteroaryl is 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl or 4-pyridyl optionally substituted by lower alkyl or lower alkoxy.

4. A method of blocking histamine H_2-receptors which comprises administering an effective amount of a compound of claim 1 to an animal in need of such treatment.

4,482,564

TRIAZOLYL-SUBSTITUTED PROPANE DERIVATIVES

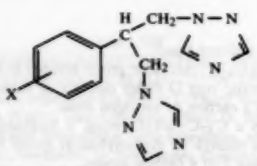
John J. Wright, Cedar Grove, and Alan B. Cooper, West Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 3, 1983, Ser. No. 501,031

Int. Cl.³ A01N *43/64;* A61K *31/41;* C07D *249/08*

U.S. Cl. 424—269 8 Claims

1. A compound represented by the formula



wherein X is 1 to 3 substituents independently selected from halogen, lower alkoxy and lower alkyl; and the pharmaceutically acceptable salts thereof.

6. A composition useful for inhibiting the growth of fungi in a human or animal having a fungal infection which comprises an antifungally effective amount of a compound of claim 1 in admixture with a pharmaceutically acceptable carrier.

4,482,565

β-LACTAM-CONTAINING ANTIBACTERIAL AGENTS AND β-LACTAMASE INHIBITORS

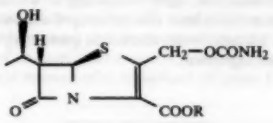
Maurizio Foglio; Giovanni Franceschi; Cosimo Scarafile; Federico Arcamone, and Aurora Sanfilippo, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 123,787, Feb. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 66,333, Aug. 14, 1979, abandoned. This application May 6, 1981, Ser. No. 261,247

Int. Cl.³ C07D *499/00;* A61K *31/425*

U.S. Cl. 424—270 5 Claims

1. A compound of the formula:



wherein R is a hydrogen atom, C_1–C_5-alkyl; 2,2,2-trichloroethyl, p-nitrobenzyl, acetonyl, or acetoxymethyl and a pharmaceutically acceptable salt thereof.

4,482,566

SUBSTITUTED AMINOALKYLBENZENE TYPE LOWER ACYLAMIDES

Kentaro Hirai, Kyoto; Teruyuki Ishiba; Shigeru Matsutani, both of Osaka; Itsuo Makino, Hyogo; Toshio Fujishita, Osaka, all of Japan; Masami Doeteuchi, Noordwykerhout, and Koichi Otani, Voorberg, both of Netherlands, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

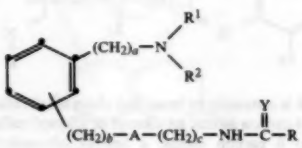
Division of Ser. No. 164,016, Jun. 30, 1980, Pat. No. 4,309,433. This application Jun. 25, 1981, Ser. No. 277,161

Claims priority, application Japan, Jul. 3, 1979, 54-84801

Int. Cl.³ C07D *207/04;* C07C *103/34, 103/37;* A61K *31/135*

U.S. Cl. 424—274 3 Claims

1. A compound of the formula



wherein

A is oxygen or sulfur,

Y is oxo or thioxo,

a is an integer of 1 to 3,

b is an integer of 0 to 3,

c is an integer of 1 to 4,

R^1 is C_1–C_5 alkyl,

R^2 is hydrogen or C_1–C_5 alkyl or

R^1 and R^2 taken together represent pyrrolidinyl, and,

R is C_3–C_6 cycloalkyl, trifluoromethyl, trifluoroethyl or dibromochlorobutyl,

or a pharmaceutically acceptable acid addition salt thereof.

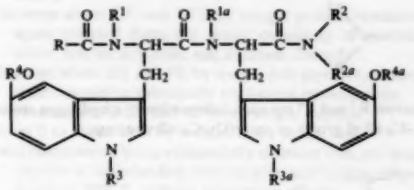
3. A method for the treatment of peptic ulcer which comprises administering enterally or parenterally a pharmaceutically effective amount of a pharmaceutical composition of claim 2 to a patient suffering from peptic ulcer.

4,482,567
N-HEXANOYL TO N-HEPTADECANOYL 5-HYDROXY TRYPTOPHAN-5-HYDROXYTRYPTOPHANAMIDES AND USE AS ANALGESICS

Hadassah Tamir, Teaneck, N.J.; Stephen E. Karpiak, New York, N.Y., and Meir Wilchek, Rehovoth, Israel, assignors to Research Foundation for Mental Hygiene, Inc., New York, N.Y. and Yeda Research and Development Co. Ltd., Rehovoth, Israel

Filed Oct. 7, 1982, Ser. No. 433,283
Int. Cl.³ A61K *31/405;* **C07D** *401/12*
U.S. Cl. 424—274 **12 Claims**

1. A compound selected from the group consisting of 5-hydroxytryptophan derivatives of the formula:



wherein R is selected from the group consisting of C_5–C_{16} alkyl;

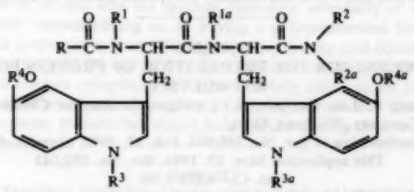
R^1 and R^{1a} are each H or methyl;

R^2 and R^{2a} are each H or R, as defined above;

R^3 and R^{3a} are each H or alkyl having from 1 to 4 carbons;

R^4 and R^{4a} are each H or alkyl having from 1 to 4 carbons; and their non-toxic, pharmacologically acceptable acid addition salts.

9. A method of raising the pain threshold in warm-blooded animals which comprises administering to said animals an effective amount of a compound selected from the group consisting of 5-hydroxytryptophan derivatives of the formula:



wherein R is selected from the group consisting of C_5–C_{16} alkyl;

R^1 and R^{1a} are each H or methyl;

R^2 and R^{2a} are each H or R, as defined above;

R^3 and R^{3a} are each H or alkyl having from 1 to 4 carbons;

R^4 and R^{4a} are each H or alkyl having from 1 to 4 carbons; and their non-toxic, pharmacologically acceptable acid addition salts.

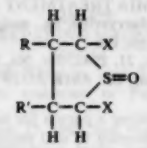
4,482,568
INHIBITION OF ALCOHOL METABOLISM BY TETRAMETHYLENE SULFOXIDES

Bryce V. Plapp, Iowa City, and Vijay K. Chadha, Coralville, both of Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Oct. 17, 1983, Ser. No. 542,482
Int. Cl.³ A61K *31/38;* **C07D** *333/00*
U.S. Cl. 424—275 **16 Claims**

1. A method of inhibiting alcohol metabolism in warm blooded animals comprising

treating the animal with a small but therapeutically effective dosage of a compound of the formula:



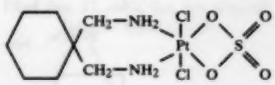
wherein R and R′ are selected from the group consisting of hydrogen, alkyl, aryl, alkaryl, aralkyl, cycloalkyl, and X is selected from the group of hydrogen and fluoride.

4,482,569
PLATINUM (IV)-DIAMINE COMPLEXES, A PROCESS FOR THE PREPARATION OF PHARMACEUTICAL COMPOSITIONS AND A METHOD OF TREATING MALIGNANT TUMORS IN MICE

Eric J. Bulten, Bilthoven, and Francois Verbeek, Harmelen, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepastnatuurweten-Schappelijk Onderzoek, The Hague, Netherlands

Continuation-in-part of Ser. No. 232,298, Feb. 6, 1981,. This application Jan. 18, 1983, Ser. No. 458,979
Claims priority, application Netherlands, Jan. 3, 1980, 8000032; Japan, Dec. 30, 1980, 55-189451
The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.
Int. Cl.³ A01N *55/02;* **A61K** *31/28;* **C07F** *15/00*
U.S. Cl. 424—287 **9 Claims**

1. Cis-sulfato-trans-dichloro-1,1-bis(aminomethyl)-cyclohexane-platinum(IV) having the formula:



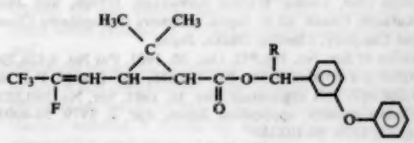
4. A pharmaceutical composition comprising a suitable carrier and an amount of the compound described in claim 1 sufficient to treat malignant tumors in mice.

4,482,570
PYRETHROIDS

Paolo Piccardi; Francesco Corda, both of Milan; Franco Gozzo, San Donato Milanese; Augusto Menconi, and Angelo Logoni, both of Milan, all of Italy, assignors to Montedison, S.p.A., Milan, Italy

Division of Ser. No. 273,541, Jun. 15, 1981, Pat. No. 4,379,163, which is a continuation of Ser. No. 15,105, Feb. 26, 1979, Pat. No. 4,238,237. This application Sep. 30, 1982, Ser. No. 430,474
Claims priority, application Italy, Feb. 28, 1978, 20713 A/78; Jan. 30, 1979, 19703 A/79
Int. Cl.³ A01N *53/00;* **C07C** *69/743, 121/75*
U.S. Cl. 424—304 **10 Claims**

1. A compound of the formula:



wherein R is hydrogen or cyano.

9. A method for fighting infestations by insects and acari, comprising distributing in the zone to be protected, an effective amount of one or more of the compounds of claim 1.

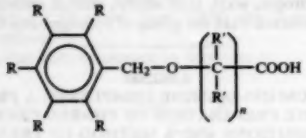
4,482,571

SICKLE CELL ANEMIA TREATMENT AND COMPOUND

Donald J. Abraham, Murrysville, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Jun. 21, 1982, Ser. No. 390,760
Int. Cl.[3] A61K *31/19*
U.S. Cl. 424—317 **8 Claims**

1. A method of treating a person for sickle cell anemia including orally administering to said person a therapeutically effective dosage of the compound



wherein at least one R=Cl, Br, CH_3 or OCH_3 and all the remaining R=H, R^1=H or CH_3 and n=1, 2, 3, 4 or 5.

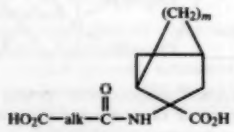
4,482,572

1-ACYLAMINO-1-CYCLOPENTANECARBOXYLIC ACIDS

David L. Ladd, Overbrook Hills, and Joseph Weinstock, Phoenixville, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed May 5, 1983, Ser. No. 491,619
Int. Cl.[3] A61K *31/195*; C07C *103/737*
U.S. Cl. 424—319 **8 Claims**

1. A compound of the structural formula:



in which:

m is 0 or 2, and

alk is alkylene of 1–4 carbons; or a pharmaceutically acceptable salt thereof with a nontoxic organic or inorganic base.

8. The method of inducing renal vasodilation, anti-hypertensive and diuretic activity in a patient in need thereof comprising administering orally, rectally or parenterally to said patient a quantity of a compound of claim 1 which is nontoxic and effective therefor.

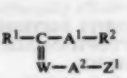
4,482,573

DIPHENYLALKANOETHER AND DIPHENYLALKANONE OXIMEETHER DERIVATIVES

Keiichi Ono, Osaka; Hajime Kawakami, Hyogo, and Junki Katsube, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 316,972, Oct. 30, 1981, Pat No. 4,426,394, which is a division of Ser. No. 136,565, Apr. 2, 1980, Pat. No. 4,388,469. This application Nov. 10, 1983, Ser. No. 550,583
Claims priority, application Japan, Apr. 2, 1979, 54-40032; Aug. 13, 1979, 54-103340
Int. Cl.[3] A61U *31/15, 31/135, 31/255, 31/275*
U.S. Cl. 424—327 **21 Claims**

1. A pharmaceutical composition comprising an effective cerebral vasodilating amount of at least one compound of the formula:



wherein R^1 and R^2 are each independently a non-heterocyclic aryl group optionally substituted with 1 to 3 substituents selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, cyano, di(C_1–C_4)alkylamino, amino, benzyloxy, hydroxyl, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, C_1–C_4 alkanoylamino, C_1–C_4 alkylamino and N-(C_1–C_4)alkyl-N-(C_1–C_4)alkanoylamino, Z^1 is a group of the formula:

wherein R^3 and R^4 are each independently a hydrogen atom, a C_1–C_4 alkyl group or an ar(C_1–C_4)alkyl group;

is a group of the formula:

A^1 is a C_2–C_6 alkylene group and

A^2 is a C_2–C_4 alkylene group,

or a non-toxic, pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable diluent or carrier.

4,482,574

PROCESS FOR THE PREPARATION OF PROTEIN FOR HYDROLYSIS

Chang R. Lee, Yonkers, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 350,844, Feb. 22, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 590,543
Int. Cl.[3] A23J *3/00*
U.S. Cl. 426—7 **25 Claims**

1. A process for enzymatically hydrolyzing a proteinaceous material comprising:

(a) adjusting the pH of an aqueous solution of a proteinaceous material in which at least 50% of the protein is soluble in water at an alkaline pH ranging from about 7 to about 10 to a pH within the range of from about 7.5 to about 10 and at least 0.5 pH units above the native pH of the solution of proteinaceous material, said solution having a temperature of less than about 30° C., the total dissolved protein content ranging from about 0.5% and about 20% by wieght when determined at said pH;

(b) heating the alkaline solution of step (a) to an elevated temperature within the range of from about 50° C. and about 150° C. at a rate insufficient to cause gelation of the solution;

(c) cooling said heated solution to a temperature within the range of from about 30° C. to about 2° C. within 1 hour after the said solution reaches its maximum temperature level, said cooling being conducted at a rate sufficient to prevent gelation of said protein containing solution; and

(d) enzymatically hydrolyzing the protein in the so treated solution to convert the protein to a hydrolyzate.

4,482,575

AERATED OIL-BASED CHEESE MIXTURE

Dale F. Olds, Dublin, Calif., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Sep. 8, 1982, Ser. No. 415,938
Int. Cl.³ A23C *19/00;* A23D *5/00*
U.S. Cl. 426—582 9 Claims

1. An aerated or aeratable oil-based cheese composition which is capable of withstanding hot extrusion and baking temperatures, comprising:

between about 38% and 50% by weight bland stable hydrogenated vegetable oil;

between about 20% and 40% by weight powdered cheese solids;

between about 8% and 18% by weight protein containing agent selected from the group consisting of modified whey, non-fat dry milk, and mixtures thereof;

between about 2% and 4% by weight polyglycerol monostearate containing principally triglycerol monostearate;

between about 0.3% and 0.7% by weight lecithin;

from 0 to about 20% by weight whey solids; and

said composition being substantially moisture free, and being capable of withstanding hot extrusion and baking temperatures of 300° F. without deleterious effects.

4,482,576

METHOD FOR TREATING AN EDIBLE OIL BY ISOTHERMAL DIRECTED INTERESTERIFICATION

Jacobus Boot, VZ Vlaardingen; Adrianus Rozendaal, BA Vlaardingen, and Robert Schijf, NL Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,292
Claims priority, application United Kingdom, Mar. 11, 1981, 8107657
Int. Cl.³ A23D *3/02;* C11C *3/10*
U.S. Cl. 426—603 15 Claims

1. Method for treating an edible oil comprising triglycerides rich in linoleic acid the method consisting essentially of directed interesterifying an oil having a polyunsaturated fatty acid content of at least 60% and a saturated fatty acid content of between 12.5% and 16%, at least a part of the saturated fatty acid content comprising hydrogenated fatty acids, under isothermal conditions, the resultant oil being suitable for use in margarine manufacture absent temperature cycling treatment.

4,482,577

COATING PROCESS OF ELASTOMERIC MATERIAL

Albert Goldstein, Glenwood Ave., Tinton Falls, N.J. 07724, and Howard I. Podell, 28 Beachfront La., New Rochelle, N.Y. 10805

Filed Dec. 16, 1980, Ser. No. 216,889
Int. Cl.³ A61B *19/04;* B05D *3/10*
U.S. Cl. 427—2 2 Claims

1. A method of coating of a vulcanized latex rubber product, so as to coat a surface of the product with a hydrophilic poylmer comprising the following steps:

(1) Clean the product surface by washing;

(2) Immerse the product into a treatment solution of highly concentrated sulfuric acid solution of a concentration of at least substantially 95% concentration of sulfuric acid;

(3) Remove the product from the said treatment solution;

(4) Wash the product surface;

(5) Immerse the product into a coating solution of a hydrophilic polymer;

(6) Remove the product from the coating solution; and

(7) Heat the coated product for a period of time; in which the said treatment solution of sulfuric acid is maintained at a temperature substantially below seventeen degrees Celsius so as to minimize a stiffening effect to the latex rubber product otherwise resulting from the action of the treatment solution on the said product.

4,482,578

METHOD FOR PREPARING MAGNETIC RECORDING MEDIA

Goro Akashi; Tatsuji Kitamoto, and Tsutomu Okita, all of Kanagawa, Japan, assignors to Fuji Photo Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1983, Ser. No. 505,509
Claims priority, application Japan, Jun. 17, 1982, 57-104133
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—44 19 Claims

1. A method for preparing a magnetic recording medium comprising a non-magnetic support having coated thereon a magnetic layer containing plate-shaped ferromagnetic fine particles having the axis of easy magnetization thereof oriented perpendicular to a plane of the surface of the support, the process comprising the steps of:

coating the non-magnetic support with a coating composition wherein ferromagnetic fine particles are dispersed in a solution comprised of a compound polymerizable by radiation with electron beams and a solvent, said particles being plate-shaped and having an axis of easy magnetization perpendicular to a plate of the plate-shaped particles;

orienting the axis of easy magnetization of the ferromagnetic fine particles perpendicular to the surface of support while the coating composition is undried;

radiating the composition with electron beams; and

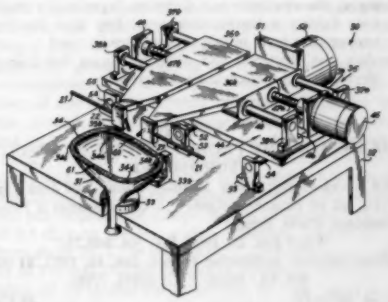
drying the composition by removing the solvent.

4,482,579

APPARATUS FOR SUPPLYING VISCOUS MATERIAL

Makoto Fujii; Akira Ikuzawa, both of Escondido, and Edward C. Sullivan, San Diego, all of Calif., assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,637
Int. Cl.³ C03C *17/04*
U.S. Cl. 427—64 15 Claims



1. An apparatus for applying viscous material to a surface of an article comprising:

supply means for providing a gas under pressure;

saturating means for saturating said gas with a vaporized solvent for said viscous material to deter drying of the latter when exposed to the saturated gas under pressure; and

containment means for containing said viscous material and to which said saturated gas under pressure is supplied, said containment means having an outlet through which said viscous material is forced by said saturated gas under pressure for application to said surface.

8. A method of applying a viscous material to a surface of an article which comprises the steps of:

pressurizing a gas;

saturating said gas with a solvent for said viscous material; and

applying said saturated gas under pressure to a vessel con-

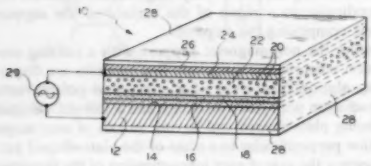
taining said viscous material and having an outlet through which said viscous material is forced by said saturated gas under pressure for application to said sealing surface.

4,482,580

METHOD FOR FORMING MULTILAYERED ELECTROLUMINESCENT DEVICE

Manley D. Emmett, P.O. Box 299, Yanceville, N.C. 27379, and Robert L. McNellis, 3 S. 216 Cypress, Glen Ellyn, Ill. 60137

Filed Dec. 14, 1981, Ser. No. 330,036
Int. Cl.³ H01J *1/62*; B05D *5/12, 3/02*
U.S. Cl. 427—66 **29 Claims**



1. A process for forming an electroluminescent device including the steps of:

forming an electrical conductive means to provide an electrode for applying electrical voltage;

disposing a layer of dielectric material over said electrode;

inserting the electrode and said dielectric layer into a first furnace having a first heating temperature level;

removing said electrode and dielectric layer after a first predetermined time period;

inserting the electrode and dielectric layer into a second furnace having a second heating temperature level greater than the first temperature level;

removing the electrode and dielectric layer from the second furnace after a second predetermined time period;

inserting the electrode and dielectric layer into a third furnace having a temperature level less than the second temperature level in said second furnace; and

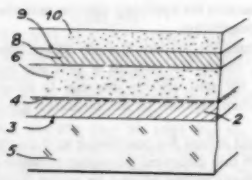
cooling the electrode and dielectric layer for fusing the electrode and dielectric layer together.

4,482,581

PROCESS FOR THE PRODUCTION OF A CAPACITIVE HYGROMETER

André Lorin, Orsay; André Rosilio, Antony, and Jean Tanguy, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 19, 1982, Ser. No. 340,732
Claims priority, application France, Jan. 19, 1981, 81 00890
Int. Cl.³ B05D *5/12*; H01L *7/00*
U.S. Cl. 427—79 **24 Claims**



1. A process for the production of a thin dielectric capacitive hygrometer of the type in which onto a layer of a conductive material forming the first electrode is deposited a layer of insulating material, whose dielectric constant varies with the quantity of water absorbed, then on said dielectric material layer is deposited a second metallic layer forming the second electrode, which is made permeable to water, wherein for producing said second electrode, onto the dielectric layer is deposited at least one layer having a thickness greater than 200 Å of a slightly oxidizable metal, which then undergoes a heat treatment at a temperature close to the softening temperature of the material forming the dielectric layer in order to make the layer permeable to water.

4,482,582

MODIFIED POLYURETHANE PRODUCT HAVING IMPROVED LOAD BEARING CHARACTERISTICS

Morey Weisman, 147-23 Charter Rd., Jamaica, N.Y. 11435

Continuation-in-part of Ser. No. 414,884, Sep. 3, 1982, Pat. No. 4,439,548. This application Mar. 23, 1984, Ser. No. 592,715
Int. Cl.³ B05D *1/24*
U.S. Cl. 427—185 **9 Claims**

1. The method of enhancing the dielectric heat sealing characteristics of an open cell polyurethane foam product, comprising the steps of:

A feeding powders of a plastic material whose dielectric loss index is greater than that of polyurethane and water vapor into a pressurized stream of air which is projected at relatively high velocity to fluidize the powders and disperse the vapors; and

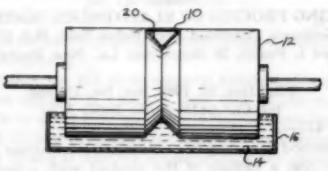
B directing the stream toward the surface of the product to cause the powders and vapor conveyed thereby to impregnate the cells at the surface of said open celled polyurethane foam product.

4,482,583

PROCESS FOR SEALING REAGENT RIBBONS

M. Sultan Siddiqi, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 20, 1983, Ser. No. 496,453
Int. Cl.³ B05D *5/00*
U.S. Cl. 427—284 **4 Claims**



1. The process of sealing two opposite edges of substantially flat reagent ribbon without otherwise affecting impregnated reagent in said reagent ribbon, which process comprises, passing the impregnated reagent ribbon over a circumferentially grooved applicator roll which applicator roll is partially submerged in a heated container having sealing liquid which is entrained by the grooved roll as the applicator roll rotates such that sealing liquid from the heated sealing liquid container is transported to and contacts only the edges of the reagent ribbon as the reagent ribbon is suspended in the groove of the applicator roll by its edges and maintaining the reagent ribbon in contact with the grooved applicator roll for sufficient period of time to cause the liquid sealing material to contact and seal the edges of the reagent ribbon.

4,482,584

PAINTING A BAND ON A TUBE

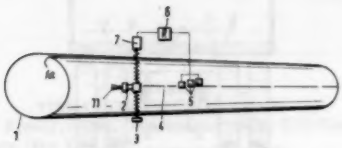
Walter Hess; Franz Nicolai, and Otto Götting, all of Mülheim, Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 401,616

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1981, 3130119

Int. Cl.³ B05D 1/02

U.S. Cl. 427—286 3 Claims



1. Method of controlling the position of a colored band on a split tube and in relation to a longitudinal edge thereof, being one edge of a bent plate, .here being an adjustable spray gun for providing said band, comprising the steps of

positioning a scanning unit in particular relation to said edge, the particular relation defining a position of an edge of the band;

scanning the edge of the band as it has been painted by the spray gun; and

adjusting the spray gun in dependence upon the scanning so as to maintain the particular relation between the band and the edge of the split tube throughout.

4,482,585

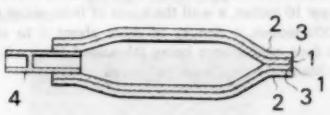
CONTAINER RESISTANT TO EXTREMELY LOW TEMPERATURES

Takeo Ohodaira, Funabashi, and Takashi Mizutani, Tokyo, both of Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Jun. 11, 1982, Ser. No. 387,359

Int. Cl.³ B65D 33/16

U.S. Cl. 428—35 7 Claims



1. A container resistant to extremely low temperatures, comprising a laminated body comprising an inner layer and an outer layer adhesively bonded together, the inner layer comprising a non-stretched film of a polyethylene which is prepared by the low polymerization method and which has a viscometric average molecular wreight of not less than 1,000,000 and a light-scattering average molecular weight of not less than 3,000,000, and the outer layer comprising a member selected from the group consisting of biaxially stretched polyethylene terephthalate, stretched or non-stretched polyethylene naphthalate, polyparabanic acid resin, perfluoroalkoxy resin, polytetrafluoroethylene, ethylene-tetrafluoroethyene copolymer, chlorinated trifluoroethylene resin, and aromatic polyimide resin.

4,482,586

MULTI-LAYER POLYISOPHTHALATE AND POLYTEREPHTHALATE ARTICLES AND PROCESS THEREFOR

Richard R. Smith, Cuyahoga Falls, and Charles L. Kern, Jr., North Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 7, 1982, Ser. No. 415,306

Int. Cl.³ B65D 1/02; B32B 7/02, 27/08

U.S. Cl. 428—35 25 Claims

14. A multi-layer packaging material, comprising:

(a) at least a layer made from a polyterephthalate compound, said polyterephthalate compound being made by the reaction of a compound selected from the group consisting of terephthalic acid, dimethylphthalate, diethylphthalate, and combinations thereof with ethylene glycol, wherein said polyterephthalate compound has an intrinsic viscosity of 0.6 dl/g or greater and a glass transition temperature of from about 60° C. to about 100° C.; and

(b) at least a layer made from a polyisophthalate compound or copolymers thereof, said polyisophthalate compound made by the reaction of an isophthalic compound selected from the group consisting of isophthalic acid, dimethylisophthalate, and diethylisophthalate with a glycol, wherein said glycol is ethylene glycol which contains from 0 to 35 mole percent of one or more diols selected from the group consisting of cyclohexanedimethylol, tetramethylene glycol, and propylene glycol, said copolymers of said polyisophthalate compound being the reaction product of said isophthalic compound, said glycol, and up to 30 mole percent of a dicarboxylic compound selected from the group consisting of terephthalic acid, a dimer acid having 36 carbon atoms, dimethylterephthalate, azelate, and 2,6-naphthalene dicarboxylate, wherein said polyisophthalate compound has an intrinsic viscosity of 0.5 dl/g or greater, a glass transition temperature of from about 35° C. to about 100° C., an oxygen permeability of 7 cc-mil/100 in^2-day-atm or less, and a CO_2 permeability of 30 cc-mil/100 in-day-atm or less; wherein the layer made from a polyisophthalate compound has a thickness which ranges from about 10 percent to about 90 percent of the total thickness of the packaging material.

4,482,587

BONDING COMPOSITIONS AND SHAPED ARTICLES UTILIZING THE BONDING COMPOSITIONS

David R. Fagerburg; Freddie A. Shepherd, both of Kingsport; Benny W. Wright, Bluff City, and I. Daniel Sand, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1983, Ser. No. 496,344

Int. Cl.³ B65D 3/00; B32B 27/10; C08F 12/30

U.S. Cl. 428—35 19 Claims

1. A bonding composition for bonding polyesters and copolyesters to poly(vinyl alcohol) and copolymers thereof, said composition comprising a poly(esteramide) having an inherent viscosity of at least 0.8 dl/g, said poly(esteramide) containing

(1) repeating units from at least 70 mol percent of a dicarboxylic acid selected from pimelic, azelaic, sebacic acid or combinations thereof and optionally up to 30 mol percent of a second linear aliphatic dicarboxylic acid having at least four carbon atoms connected linearly between the two acid groups or an aromatic dicarboxylic acid;

(2) repeating units from 10 mol percent to 30 mol percent of a diamine selected from 1,6-hexanediamine, 1,4-cyclohexanebismethylamine or combinations thereof; and

(3) repeating units from 90 to 70 mol percent of a glycol selected from ethylene glycol, 1,4-butanediol, 1,4-cyclohexanedimethanol or combinations thereof.

4,482,588

BONDING COMPOSITIONS AND SHAPED ARTICLES UTILIZING THE BONDING COMPOSITIONS

David R. Fagerburg; Freddie A. Shepherd, both of Kingsport; Benny W. Wright, Bluff City, and I. Daniel Sand, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1983, Ser. No. 496,345

Int. Cl.³ B65D *3/00*; **B32B** *27/10*; **C08F** *12/30*

U.S. Cl. 428—35 **18 Claims**

1. A bonding composition for bonding polyesters and copolyesters to poly(vinyl alcohol) and copolymers thereof, said composition comprising a poly(esteramide) having an inherent viscosity of at least 0.8 dl/, said poly(esteramide) containing

(1) repeating units from at least 70 to 90 mol percent of a dicarboxylic acid selected from adipic, pimelic, suberic, azelaic, sebacic acid or combinations thereof and 10 to 30 mol percent of a second linear aliphatic dicarboxylic acid having at least four carbon atoms connected linearly between the two acid groups or an aromatic dicarboxylic acid;

(2) repeating units from 10 mol percent to 30 mol percent of a diamine selected from 1,6-hexanediamine, 1,4-cyclohexanebismethylamine or combinations thereof; and

(3) repeating units from 90 to 70 mol percent of a glycol selected from ethylene glycol, 1,4-butanediol, 1,4-cyclohexanedimethanol or combinations thereof; and wherein repeating units from said second linear aliphatic dicarboxylic acid and repeating units from said diamine are present in equal molar amounts.

4,482,589

METAL COVERED CELLULAR PVC

Jan Widman, Halmstad, Sweden, assignor to Additainer AB, Halmstead, Sweden

PCT No. PCT/SE82/00409, § 371 Date Jul. 14, 1983, § 102(e) Date Jul. 14, 1983, PCT Pub. No. WO83/02097, PCT Pub. Date Jun. 23, 1983

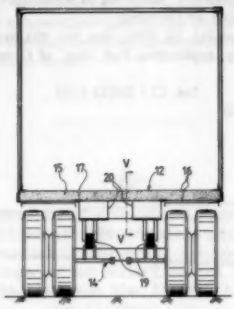
PCT Filed Dec. 1, 1982, Ser. No. 518,309

Claims priority, application Sweden, Dec. 10, 1981, 8107409

Int. Cl.³ B32B *3/02, 1/02, 15/08*

U.S. Cl. 428—35 **13 Claims**

1. A self carrying platform forming a closed goods accommodating space, preferably for refrigerator/freezer trailers, where at least the bottom of the goods accommodating space comprises a core of constructional cellular plastic and surface layers laminated to the core, the improvement being in that the core consists of a constructional cellular plastic of PVC having a density within the range of 60 to 100 kg/m³, preferably 80 kg/m³, relatively thin metal plates are attached to and cover



both sides of the core, and a mounting plate for a wheel shaft arrangement is adhesively attached to said core.

4,482,590

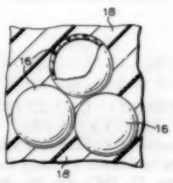
DEEP WATER FLOTATION DEVICES

Robert W. Bouley, East Springfield, and Robert F. Kovar, Wrentham, both of Mass., assignors to Syncom International, Inc., Agawam, Mass.

Filed Aug. 9, 1983, Ser. No. 521,597

Int. Cl.³ B32B *3/26, 5/16*

U.S. Cl. 428—35 **6 Claims**



1. A macrosphere for use in a buoyancy device, which comprises; a hollow, closed sphere having a diameter of from about 0.5 to about 10 inches, a wall thickness of from about 0.010 to about 0.500 inches, a density of from about 6 to about 32 lbs/cubic foot, said sphere being fabricated from a hardened syntactic foam of a synthetic, polymeric resin.

4,482,591

POLYVINYL BUTYRATE PELLICLE COMPOSITIONS AND PELLICLES THEREOF FOR PROJECTION PRINTING

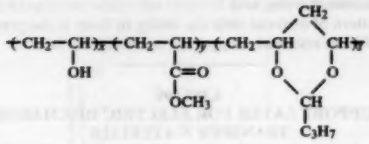
Irl E. Ward, Easton, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Mar. 8, 1983, Ser. No. 473,280

Int. Cl.³ G02B *5/00*

U.S. Cl. 428—66 **2 Claims**

1. A pellicle for use in projection printing comprising a cast polyvinyl butyral film mounted in a pellicle mounting ring and wherein the polyvinyl butyral has the formula



wherein x is ≦0.13, y is ≦0.02 and z is ≧0.88.

4,482,592

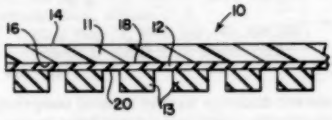
VIBRATION ISOLATION PAD

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 237,232, Feb. 23, 1981, Pat. No. 4,436,274. This application Sep. 2, 1983, Ser. No. 528,821

Int. Cl.³ F16M *1/00*

U.S. Cl. 428—67 **5 Claims**



1. A pad for isolating the vibrations of a machine having an upper layer of ultra-high molecular weight polyethelene, a lower layer of elastomer secured to the lower surface of said upper layer, and a plurality of laterally and longitudinally spaced elastomeric projections molded to the lower surface of said lower layer to provide vibration isolation to materials loaded on said pad.

4,482,593

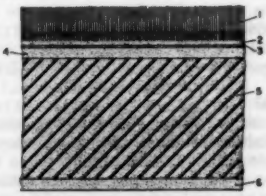
FLOCKED FLOOR MAT WITH HYDROPHILIC ADHESIVE

Paul J. Sagel, Cincinnati, and Toan Trinh, Maineville, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 20, 1982, Ser. No. 420,427

Int. Cl.³ B05D *1/14*

U.S. Cl. 428—90 **14 Claims**



1. A flocked article comprising a hydrophilic flocking adhesive, flock fibers, a thin primary backing selected from nonwoven substrates, woven substrates and polymeric film substrates, and a secondary backing; the flock fibers are bonded perpendicularly to the primary backing with the hydrophilic flocking adhesive; the primary backing is affixed to the secondary backing; said hydrophilic flocking adhesive has a water contact angle of from 0° to 70°.

4,482,594

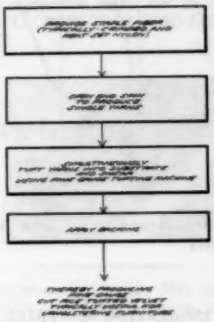
FINE GAUGE CUT PILE TUFTED VELVET

Olay Stousland, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed May 27, 1981, Ser. No. 267,618

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—92 **15 Claims**



1. A process for producing an improved fine gauge cut pile tufted velvet, comprising:

crimping and heat setting staple fiber;

open end spinning the crimped and heat set staple fiber to produce yarn;

fine gauge tufting the yarn into a substrate and simultaneously cutting the tufts to produce a sheared pile; and

applying a backing to secure the pile to the substrate.

4,482,595

PRIMARY BACKING OF FOAMED POLYPROPYLENE TAPES AND TUFTED CARPETS PRODUCED FROM THE SAME

Kusuo Fujishita, Kasugai; Hideshi Sakamoto, Ichihara; Tomio Yamazawa, and Junichi Yamaguchi, both of Minamata, all of Japan, assignors to Chisso Corporation and Japan Polypro Backing Co. Ltd., both of Ohsaka, Japan

Filed Mar. 20, 1984, Ser. No. 591,496

Int. Cl.³ B32B *27/16*

U.S. Cl. 428—95 **6 Claims**

4. A tufted carpet produced by the use of a primary backing prepared by weaving polypropylene tape yarns oriented by stretching, which polypropylene tape yarns comprise foamed polypropylene tape yarns having a foam content of 1.0 to 20%.

4,482,596

ELECTROLESS ALLOY PLATING

Michael Gulla, Sherborn, and Oleh B. Dutkewych, Harvard, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

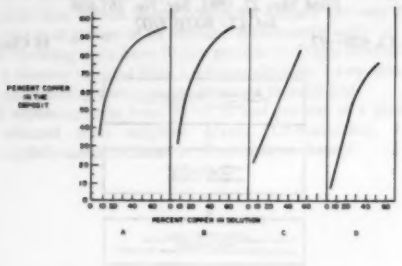
Division of Ser. No. 308,778, Oct. 5, 1981, , which is a continuation-in-part of Ser. No. 187,552, Sep. 15, 1980, abandoned. This application Aug. 25, 1982, Ser. No. 411,346

Int. Cl.³ B32B *3/10, 15/04*

U.S. Cl. 428—131 **30 Claims**

2. A structure comprising a catalytic surface plated with an autocatalytic electroles alloy of copper, nickel, and phosphorous where the copper comprises from 70 to 99 percent by

weight of the deposit, the phosphorous comprises from 0.1 to



10 percent by weight of the alloy and the nickel comprises the balance of the alloy.

4,482,597

INSULATING MATERIAL

Peter Smith, Hoddesdon, England, assignor to Spic International Limited, Hoddesdon, England

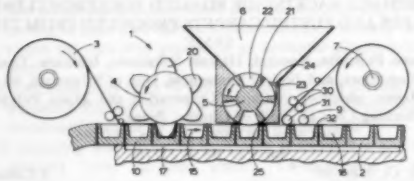
PCT No. PCT/GB82/00127, § 371 Date Dec. 14, 1982, § 102(e) Date Dec. 14, 1982, PCT Pub. No. WO82/03821, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 28, 1982, Ser. No. 453,891

Claims priority, application United Kingdom, Apr. 29, 1981, 8113271; May 28, 1981, 8116352

Int. Cl.³ B32B *1/06*; F16L *59/08, 59/02*

U.S. Cl. 428—166 **13 Claims**



1. An insulating material comprising a flexible web of spaced impervious material, a plurality of individual strips of insulation material extending transverse to the longitudinal axis of the flexible web each strip being completely encompassed by impervious material, and a metal foil forming at least one outer surface of the insulating material.

4,482,598

TRANSFER SHEETS AND PRODUCTION OF DECORATIVE ARTICLES THEREWITH

Taiji Ishii, Tokyo, and Takashi Tarutani, Sakado, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Sep. 17, 1982, Ser. No. 419,525

Claims priority, application Japan, Sep. 21, 1981, 56-149050; Apr. 12, 1982, 57-60678

Int. Cl.³ B32B *3/10, 5/20, 31/00*

U.S. Cl. 428—195 **20 Claims**

1. A transfer sheet for producing decorative articles having foamed convex parts, comprising:

a substrate having a surface for releasably supporting a pattern thereon; and

a pattern of material with the ability to foam in the presence of heat, releasably supported upon said surface.

4,482,599

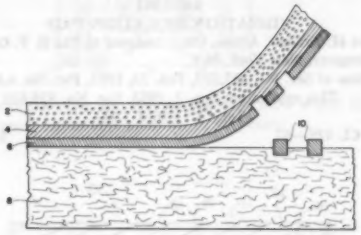
SUPPORT LAYER FOR ELECTRIC DISCHARGE TRANSFER MATERIALS

Ray H. Luebbe, Jr., Maitland, and Mark A. Carter, Casselberry, both of Fla., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 6, 1982, Ser. No. 395,103

Int. Cl.³ B41M *5/24*; G01D *15/06*; G32B *5/16*

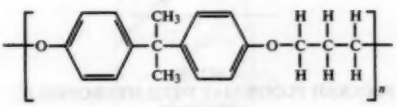
U.S. Cl. 428—212 **14 Claims**



1. An electric discharge transfer material comprising:

(a) an electrically anisotropic support layer having electroconductive particles dispersed in a resin; and

(b) at least one thermal or electrothermal transfer layer in the form of a resin layer capable of being broken by electrical discharge and transferred to a record sheet, one of said transfer layers being laminated to said support layer, the improvement wherein said resin in the support layer comprises a phenoxy resin of the formula:



wherein n is about 100.

4,482,600

SPOT-WELDABLE LIGHTWEIGHT COMPOSITE MATERIAL

Yoshihiro Matsumoto, Chiba; Masatoshi Shinozaki, Mobara, and Toshio Irie, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Sep. 7, 1982, Ser. No. 415,373

Claims priority, application Japan, Mar. 18, 1982, 57-43207

Int. Cl.³ B32B *7/02, 9/00*

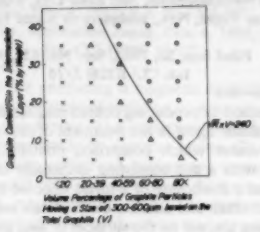
U.S. Cl. 428—213 **1 Claim**

1. In a spot-weldable lightweight composite material consisting of two metal sheets and an intermediate layer consisting of a mixture of resin and graphite and held between the metal sheets, an improvement comprising said intermediate layer having a thickness not smaller than the sum of the thicknesses of the two metal sheets and having a graphite content R of 10–50% by weight, and the graphite having a particle size distribution which satisfies the following relation

$$\sqrt{R} \times V \geq 240$$

wherein R represents the above described graphite content,

and V represents the volume percentage of graphite particles, which have a size within the range of from $\frac{1}{4}$ to 1 time thickness



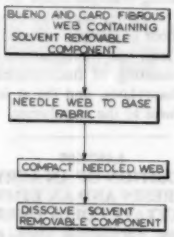
of the intermediate layer, based on the total amount of the graphite.

4,482,601

WET PRESS PAPERMAKERS FELT AND METHOD OF FABRICATION

Richard J. Hartigan, Jr., Delmar, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed May 31, 1983, Ser. No. 499,350
Int. Cl.³ B32B 5/02; D06H 7/22
U.S. Cl. 428—234 **2 Claims**


BLEND AND CARD FIBROUS WEB CONTAINING SOLVENT REMOVABLE COMPONENT
NEEDLE WEB TO BASE FABRIC
COMPACT NEEDLED WEB
DISSOLVE SOLVENT REMOVABLE COMPONENT

1. An intermediate wet-press felt fabric, which comprises:
a first layer of interwoven machine direction and cross-machine direction yarns; and
a second layer of non-woven staple fibers, needled to the first layer;
said staple fibers including a proportion of solvent removable fibers and a proportion of solvent resistant fibers.

4,482,602

DIELECTRICALLY HEATABLE POLYOLEFIN FOAMS CONTAINING UNSATURATED POLYESTER

Bruno Pellicelli, Mapello, Italy, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 490,148, Apr. 29, 1983, Pat. No. 4,454,256. This application Mar. 1, 1984, Ser. No. 585,268
Claims priority, application Italy, May 11, 1982, 21191 A/82
Int. Cl.³ B32B 5/22, 7/04
U.S. Cl. 428—245 **8 Claims**

1. A laminate article comprising a textile layer and a foam layer wherein the foam is a dielectrically heatable, polyolefin foamed mouldings consisting essentially of from 3 to 20% by weight, based on the foam, of an unsaturated polyester obtained by a proces which comprises mixing polyolefin and 3 to 20% by weight, based on the foam to be formed, of an unsaturated polyester with a foaming agent and a crosslinking agent, extruding the mixture to a moulding, and then crosslinking and foaming the moulding by heating the moulding.

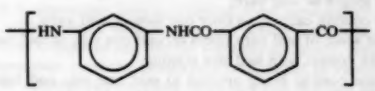
4,482,603

WHOLLY AROMATIC POLYAMIDE FIBER NON-WOVEN SHEET AND PROCESSES FOR PRODUCING THE SAME

Tsugushi Yoshida; Hideharu Sasaki; Toru Sawaki, and Keizo Shimada, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 18, 1983, Ser. No. 485,634
Claims priority, application Japan, Apr. 19, 1982, 57-63948
Int. Cl.³ B32B 27/00; D02G 3/00
U.S. Cl. 428—287 **9 Claims**

1. A wholly aromatic polyamide fiber non-woven sheet consisting essentially of wholly aromatic polyamide fibers randomly entangled with each other and consisting essentially of a wholly aromatic polyamide having 85 molar % or more of at least one type of recurring unit selected from those of the formulae (I) and (II):



(I)

and

(II)

which non-woven sheet is characterized in that said wholly aromatic polyamide fibers include (A) drawn, heat-treated fibers and (B) at least one type of fibers selected from the group consisting of undrawn, non-heat-treated fibers and partially drawn, non-heat-treated fibers, and have portions thereof having a flattened cross-sectional profile; said aromatic polyamide fibers are fuse-bonded to each other at least at portions thereof intersecting each other; and said sheet includes pores connected to each other and having a size at the peak of pore size distribution, of not larger than 13 microns determined by means of a mercury porosimeter, and no voids isolated from each other, and has a porosity of from 5% to 40% and an air permeability rate of from 0.1 to 10,000 sec/100 ml.

4,482,604

BONDED REINFORCED PLASTIC STRUCTURES

Donald D. Donermeyer, Springfield; Joseph G. Martins, Ludlow, and David A. Fabel, Springfield, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 4, 1983, Ser. No. 464,081
Int. Cl.³ B32B 25/02, 27/38
U.S. Cl. 428—336 **10 Claims**

1. A bonded reinforced plastic structure which comprises reinforced plastic parts coated with a primer coat and bonded together by a thermoplastic block copolymer, wherein the reinforced plastic is formed from sheet molding compound or bulk molding compound, wherein the primer coat comprises an epoxidized novolac resin and a resinous amidopolyamine in a weight ratio of about 2:1 to about 1:2, wherein the block

copolymer comprises from 40 to 80% by weight of crystalline polyester or polyamide segments and from 20 to 60% by weight of amorphous polyamide or polyether segments, and wherein the block copolymer has a crystalline melting point above about 155° C. and a number average molecular weight in the range of about 8000 to about 30000.

4,482,605

SIZED TEXTILE YARN FOR WEAVING

William H. Cutts, P.O. Box 748, Clemson, S.C. 29631

Continuation-in-part of Ser. No. 208,538, Nov. 20, 1980, Pat. No. 4,364,157. This application May 21, 1982, Ser. No. 380,703

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—375 **7 Claims**

1. A one-sided sized warp yarn for use in weaving a fabric on a loom comprising:

a plurality of individual yarn fibers oriented generally along the length of said yarn;

a size coating carried on only one side of said yarn;

at least some of said yarn fibers on said one side of said yarn being coated with said size coating;

said size coating being applied to said one side and being dispersed and dissipated from said applied side through the cross-section of said yarn such that at least some of said yarn fibers on the opposite side of said yarn are devoid of any size coating.

4,482,606

ISODIAMETRICAL MICROCAPSULES WITH REGULARIZED DIAMETERS AND PROCESS FOR PRODUCING SAME

Hubert Bousquet, Caluire; Jean Bernard Egraz, Lyons, and Georges Ravet, St. Genis les Ollieres, all of France, assignors to Printex, Caluire, France

Filed Mar. 9, 1982, Ser. No. 356,338

Claims priority, application France, Mar. 9, 1981, 81 04800

Int. Cl.³ B01J *13/02*; B32B *27/30*

U.S. Cl. 428—402.2 **14 Claims**

1. A microencapsulation process for the treatment of substances finely divided in an aqueous phase to simultaneously obtain isodiametrical microcapsules with regular diameters such that 80% of said diameters measure between 2 and 5 microns comprising contacting an aqueous solution of a polymer or hydrosoluble copolymer containing a functional group selected from the group consisting of —COOH, —OH, —$CONH_2$, —CONHR, —CONRR', —NH_2, NHR and NRR' wherein R and R' are each organic groups selected from the group consisting of alkyl, aryl and alkylaryl, as the shell of the capsule with a solution of the substance to be coated dispersed in at least one hydrophobic polyaryl solvent and subjecting the resulting liquid medium to a mechanical shearing action corresponding to a shearing coefficient of at least 8000 $second^{-1}$.

14. Microcapsules which are isodiametrical and having regularized diameters such that 80% of said diameters measure between 2 and 5 microns produced by the process of claim 1.

4,482,607

METHOD FOR COATING MAGNESIUM GRANULES WITH FLUORIDE-CONTAINING FLUX

Ramaswami Neelameggham, Salt Lake City, Utah, and John C. Priscu, Las Vegas, Nev., assignors to Amax Inc., Greenwich, Conn.

Filed Sep. 23, 1982, Ser. No. 421,887

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—403 **7 Claims**

1. In a method of producing coated magnesium granules for use as an addition agent in the treatment of molten metal baths, the improvement which comprises, contacting granules of magnesium with a salt consisting essentially of a mixture of fluorspar and a fluoborate of a metal selected from the group consisting of alkali and alkaline earth metals and thereby produce a coating thereof on the surfaces of said granules characterized in that the surface coating is substantially non-hygroscopic and in that the oxidation of said granules is greatly inhibited during addition of said granules to said molten metal bath.

4,482,608

RELEASE COATING FOR INFRARED IMAGEABLE AND THERMALLY IMAGEABLE FILMS

Russell R. Isbrandt, and Robert D. Lowery both of St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 26, 1982, Ser. No. 401,842

Int. Cl.³ B32B *27/00, 27/28*; G03C *5/16*

U.S. Cl. 428—421 **8 Claims**

1. Film for preparing transparencies by means of infrared imaging or thermal imaging, said film bearing an imageable layer having a top coat consisting essentially of a copolymer formed from (a) at least one fluorocarbon monomer selected from the group consisting of fluoroaliphatic acrylates and fluoroaliphatic methacrylates, and (b) at least one monomer which imparts hardness to the copolymer.

4,482,609

COATING COMPOSITION OF AN ACRYLIC POLYMER, A POLYESTER RESIN AND AN ETHYLENE/VINYL ACETATE COPOLYMER

Michael E. Woodhouse, Farmington, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 2, 1984, Ser. No. 576,353

Int. Cl.³ B32B *15/08*; C08L *33/08, 33/12*

U.S. Cl. 428—458 **9 Claims**

1. A coating composition comprising 2–25% by weight of binder and 75–98% by weight of an organic solvent; wherein the binder consists essentially of about

(a) 60–90% by weight, based on the weight of the binder, of an iminated acrylic polymer consisting essentially of polymerized units of methyl methacrylate, alkyl methacrylate or alkyl acrylate each having 2–12 carbon atoms in the alkyl group and an α-β ethylenically unsaturated monocarboxylic acid at least partially reacted with an alkyleneimine; and having a weight average molecular weight of about 20,000–80,000 determined by gel permeation chromatography;

(b) 5–20% by weight, based on the weight of the binder, of a polyester resin being the esterification product of an alkylene glycol, an aliphatic dicarboxylic acid and an aromatic monocarboxylic acid and having a weight average molecular weight of about 1,000–10,000 determined as above;

(c) 5–20% by weight, based on the weight of the binder, of an ethylene/vinyl acetate copolymer consisting essentially of about 5–15% by weight vinyl acetate and 85–95% by weight ethylene and having a number average molecular weight of about 1,000 to 5,000, determine as above.

9. A metal substrate coated with a paint layer which is coated with the composition of claim 1 and which is coated with another paint layer.

4,482,610

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

Tsutomu Okita, and Kyoichi Naruo, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 4, 1982, Ser. No. 345,907
Claims priority, application Japan, Feb. 4, 1981, 56-15392
Int. Cl.³ H01F 10/02
U.S. Cl. 428—483 6 Claims

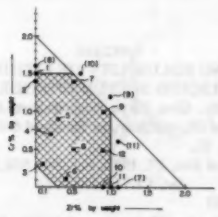
1. A process for producing a magnetic recording medium which comprises the steps of applying to a non-magnetic base a composition comprising (1) a compound having an unsaturated bond polymerizable by electron beams, (2) an electron beam polymerizable compound having one or more carbon-carbon unsaturated bonds selected from the group consisting of unsaturated monoaliphatic acids, unsaturated polybasic acids, unsaturated aliphatic acid amides, and monoalkyl unsaturated esters of sulfuric acid and phosphoric acid, (3) ferromagnetic particles, and (4) an organic solvent, and polymerizing and curing the applied coating by irradiation with electron beams, said compound having one or more unsaturated bonds being such that at least 10 wt% thereof is adsorbed onto the ferromagnetic particles in a mixture of 10 parts by weight of a 1 wt% solution of the compound and 1 part by weight of the ferromagnetic particles.

4,482,611

ELECTRONIC PARTS

Koichi Teshima; Masakazu Yamada, both of Tokyo; Toshiharu Sakurai, Yokohama, and Takemi Abe, Fujisawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 20, 1982, Ser. No. 451,461
Claims priority, application Japan, Dec. 23, 1981, 56-207190
Int. Cl.³ C23C 1/04; B32B 15/01
U.S. Cl. 428—647 7 Claims



1. An electronic part comprising:

(i) a high strength Cr and Zr deposition type copper alloy consisting essentially of Cu, Cr in an amount more than 0.3% and less than 1.5% by weight, and Zr in an amount of about 1% by weight or less, the total amount of Cr and Zr being between about 0.3% and about 2.0% by weight, said copper alloy being the product of a process comprising the steps of

(a) dissolving in substantially pure Cu at least one of Cr, in an amount more than 0.3% and less than about 1.5% by weight, or Zr, in an amount of about 1% by weight or less, the total amount of Cr and Zr being between about 0.3% and about 2.0% by weight,

(b) preparing a workpiece from the solution prepared in step (a),

(c) hot rolling said workpiece at a temperature between about 600° and about 900° C.,

(d) annealing said workpiece after hot rolling, and

(e) shaping said workpiece after step (d) to form said electronic part; and

(ii) a coating on said high strength copper alloy, said coating comprising Sn.

4,482,612

LOW ALLOY OR CARBON STEEL ROLL WITH A BUILT-UP WELD LAYER OF AN IRON ALLOY CONTAINING CARBON, CHROMIUM, MOLYBDENUM AND COBALT

Hironori Kuroki, and Tsuguo Honda, both of Fukuoka, Japan, assignors to Kuroki Kogyosho Co., Ltd., Fukuoka, Japan

Filed Aug. 13, 1982, Ser. No. 408,386
Int. Cl.³ B32B 15/18
U.S. Cl. 428—683 5 Claims

1. A roll having a built-up weld layer thereon comprising a roll body and a built-up weld layer on the surface of said roll body, said roll body consisting essentially of low alloy carbon steel, said built-up weld layer consisting essentially of no more than 0.10 percent by weight of carbon, 10~14 percent by weight of chromium, 0.1~1.0 percent by weight of molybdenum, 0.5~2.0 percent by weight of cobalt and the balance iron.

4,482,613

CELL WITH SAFE VENTING ELECTROLYTE

Michael J. Turchan, deceased, late of Sudbury, Mass. (by Susan B. Turchan, administratrix); Peter R. Moses, Windham, N.H., and Alwyn H. Taylor, Wellesley Hills, Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Feb. 16, 1983, Ser. No. 466,817
Int. Cl.³ H01M 2/12, 6/14
U.S. Cl. 429—53 20 Claims

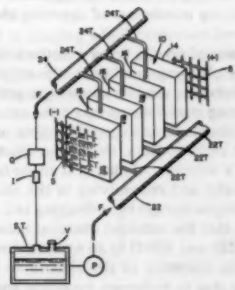
1. A method for improving the safety of a non-pressurized electrochemical cell containing an electrolyte salt and an organic electrolyte salt solvent comprising the steps of providing said cell with a pressure release vent; providing said solvent with a component, having a boiling point between 30° to 130° C., which is in a volatile state and which comprises at least 80% by volume of said solvent whereby cell abuse, resulting in temperature increase, causes said component to vaporize and to be substantially expelled from said cell through said vent thereby substantially shutting down cell operation; and under such abuse conditions substantially shutting down cell operation by vaporizing said component and substantially expelling it from the cell through said vent.

4,482,614

ZINC-BROMINE BATTERY WITH LONG TERM STABILITY

Ralph Zito, Jr., Durham, N.C., assignor to Gel, Inc., Durham, N.C.

Filed Nov. 15, 1982, Ser. No. 441,491
Int. Cl.³ H01M 2/40
U.S. Cl. 429—70 14 Claims



1. A metal-bromide secondary battery comprising:

(a) means defining an array of bipolar electrode assemblies physically spaced from each other and arranged parallel to each other;

(b) each such bipolar electrode assembly having an electrode

substrate of planar form with an aspect ratio of less than two, an area of at least 200 sq. in. an anode face and a cathode face, the electrode substrate comprising an inert material of low electrical resistance perpendicular to the sheet, i.e. on the order of less than 0.01 ohm-sq. in. and low sheet or bulk resistivity, i.e. on the order of less than 10 ohm-cm;

(c) each such electrode assembly comprising discrete charcoal particles arranged and held at the cathode face without binders, the particles being in electrical contact with each other and at least a portion thereof being in contact with the cathode face;

(d) means providing a surface enhancement of the anode face of at least 3 times;

(e) means for circulating an electrolyte of aqueous metal-bromide solution between bipolar electrode assemblies comprising inlet and outlet manifolds spanning the array and having elongated tributaries of each such manifold extending therefrom to an electrolyte flow space between each pair of opposing bipolar electrode substrates, the tributaries providing a high resistance electrical path from each manifold to the electrolyte flow space between the confronting electrode assemblies, the tributaries terminating in respective inlet and outlet through arrangements below and above the confronting anode and cathode faces;

(f) means for recirculating the electrolyte from the outlet manifold external to the batteries and then through the inlet manifold and constructed and arranged for complete drainage of electrolyte from the battery automatically upon selected abnormal occurrences;

(g) means for establishing a continuous, but relatively small, flow of electrolyte at the cathode face compared to an order of magnitude larger such flow of electrolyte between the membrane and anode face in each electrolyte flow space between confronting electrode assemblies;

(h) means defining end electrodes, one with a cathode face and one with an anode face, configured similarly to the intermediate electrode assemblies bracketing the bipolar electrode assembly array and further defining external circuit connections mounted to said end electrodes;

(i) means for flowing recirculating electrolyte between the end electrodes and the respective nearest bipolar electrode assemblies from inlet to outlet manifolds in the same manner as between bipolar electrode assemblies;

(j) means encapsulating the edges of the substrates of the electrode assemblies but allowing flow through said manifolds and tributaries to define an enclosed, leak-proof battery;

(k) means forming spaces between the anode faces and charcoal-overlaying membranes of opposing electrode assemblies;

the said apparatus of (a)–(k) being constructed and arranged such that under charging conditions, the recirculating of an aqueous metal-bromide solution electrolyte produces a build-up of metal plating out of the metal on the anode faces of the electrodes and increased storage of halogen at the charcoal particles of the cathode faces; that under discharging conditions, produces a reduction of plating at anode faces by re-ionization of the metal and redissolving in the electrolyte and a reduction of halogen storage by re-ionizing and redissolving in the electrolyte; that the unbound charcoal induces hydrolysis of bromine to HBr and HBrO to an extent automatically compensating for the tendency of the electrolyte to become increasingly basic due to hydrogen evolution and thereby provide intrinsic pH control; such that dendrite shorting and excess chemical bromine-zinc reactions are prevented by provision of a liquid well and a gas dome and uniform spreading of liquid; and that the stack of electrode assemblies and membranes and spacers is under a controlled compression to maintain rigid electrode form and determined spacing of electrodes.

4,482,615

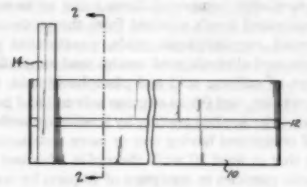
LITHIUM ANODE COMPRISING COPPER STRIP IN CONTACT WITH LITHIUM BODY AND LITHIUM-SULFUR DIOXIDE BATTERY UTILIZING SAME

Martin G. Rosansky, Montvale, N.J., and Bruce Jagid, Monsey, N.Y., assignors to Power Conversion, Inc., Elmwood Park, N.J.

Continuation-in-part of Ser. No. 430,691, Sep. 30, 1982, abandoned. This application Aug. 1, 1983, Ser. No. 518,035

Int. Cl.[3] **H01M** *4/02, 6/10*

U.S. Cl. 429—94 **8 Claims**



1. A lithium anode for utilization in a lithium cell comprising a lithium body having inlaid in one face thereof, a copper strip extending the substantial full length of said lithium body, the ratio of copper area contributed by said copper strip to the lithium area of the lithium body, computed for the anode face to which the copper strip is inlaid, being from about 0.02 to 0.25.

4,482,616

CONTROLLING SOLUBILITY OF LITHIUM SALTS IN LIQUID SULFUR DIOXIDE

John F. Connolly, Glen Ellyn, and Robert J. Thrash, Carol Stream, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 27, 1983, Ser. No. 508,524

Int. Cl.[3] **H01M** *6/14*

U.S. Cl. 429—101 **20 Claims**

1. A method for modifying the solubility of a lithium salt in a non-aqueous solvent system which comprises dissolving said lithium salt and a solubility modifying additive in the solvent system, wherein said solvent system comprises a major portion of sulfur dioxide, the amount of said lithium salt is in excess of the amount which is soluble in the solvent system in the absence of said solubility modifying additive, the amount of said solubility modifying additive is effective to increase the solubility of the lithium salt, and said solubility modifying additive comprises a salt which contains at least one cation selected from the group consisting of metal cation complexes, quaternary ammonium cations and organic phosphonium cations.

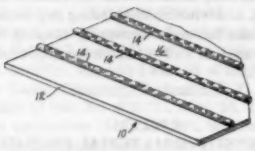
12. The composition prepared by the process which comprises dissolving a lithium salt and a solubility modifying additive in a non-aqueous solvent system, wherein said solvent system comprises a major portion of sulfur dioxide, the amount of said lithium salt is in excess of the amount which is soluble in the solvent system in the absence of said solubility modifying additive, the amount of said solubility modifying additive is effective to increase the solubility of the lithium salt, and said solubility modifying additive comprises a salt which contains at least one cation selected from the group consisting of metal cation complexes, quaternary ammonium cations and organic phosphonium cations.

4,482,617

BATTERY SEPARATORS

Rene Le Bayon, Baud; Roger Faucon, Auray, and Jacqueline Legrix, Locmine, all of France, assignors to USM Corporation, Farmington, Conn.

Filed Dec. 10, 1982, Ser. No. 447,270
Int. Cl.³ H01M 2/16, 2/18
U.S. Cl. 429—143 6 Claims



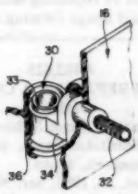
1. A substantially flat battery separator carrying a plurality of polymeric ribs on at least one surface, said ribs comprising successive elevated and depressed segments and where said elevated segments are of substantially uniform maximum height and are substantially circular in cross-section and where the rib base width is substantially uniform along the entire length of the rib.

4,482,618

AIRCRAFT BATTERY

Joseph A. Orsino, Diamond Bar; Ernest R. Sawyer, Solano Beach, and Ronald J. Hollett, Glendora, all of Calif., assignors to Concorde Battery Corporation, West Covina, Calif.

Filed May 9, 1983, Ser. No. 493,142
Int. Cl.³ H01M 2/28
U.S. Cl. 429—179 6 Claims



1. A lead-acid storage battery including a casing formed of a plastic material for containing lead and lead-oxide plates, positive and negative electrode posts connected to the plates, and said storage battery containing an acid electrolyte; a cover for the casing formed of plastic material; and a pair of terminal assemblies for the battery embedded in spaced and insulated relationship in the cover, each of the terminal assemblies comprising: a plug embedded in the cover, said plug being formed of electrically conductive material substantially impervious to corrosive attack by the acid electrolyte, and said plug having an embedded first portion positioned adjacent to a side of the cover, an elongated terminal of a predetermined electrically conductive material subject to corrosive attack by the acid electrolyte, said elongated terminal extending through said side of said cover and having a head portion received in said first portion of said plug and completely embedded in said first portion of said plug and said elongated terminal protruding outwardly through said side of said cover from the plug, said elongated terminal being protected by the cover and by the plug against corrosive attack by the acid electrolyte contained within the battery, and the plug having a tubular portion for receiving the corresponding electrode post within the casing when the cover is in place, the axis of said tubular portion being disposed at right angles to the axis of said elongated terminal.

4,482,619

X-RAY ELECTRO-PHOTOGRAPHIC RECORDING MATERIAL AND METHOD FOR GENERATING AN ELECTRICAL CHARGE IMAGE IN SUCH MATERIAL

Eberhard Bayer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,808
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227294
Int. Cl.³ G03D 41/16; G03G 5/00
U.S. Cl. 430—84 8 Claims

1. A method of generating an electrical charge image in a x-ray electro-photographic recording material comprised of successive contacting layers identified as follows:

(a) an upper photo-conductive layer composed of a vapor-deposited selenium-arsenic alloy having from about 0.1 through 10 mole percent of arsenic therein and having a free surface,

(b) an electrically-conductive layer composed of a transparent conductive material having inhibiting properties for negative charge carriers,

(c) an intermediate layer comprised of an x-ray luminophore, and

(d) a lower film carrier layer having a reflective surface facing said intermediate layer,

said method comprising the steps of:

positively charging said free surface of said photo-conductive layer in the dark by a corona discharge from an applied electrical field while maintaining said electrically conductive transparent layer as a cooperating electrode, thereby to produce a sensitive charge on said surface; and

exposing said so-charged surface to an x-ray image, thereby to produce on said surface an x-ray electrophotographic charge pattern which is developable with a toner.

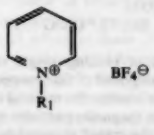
4,482,620

METHOD OF FUSING TONER COMPOSITIONS CONTAINING PYRIDINIUM TETRAFLUOROBORATES

Robert J. Gruber, Pittsford; Paul C. Julien, Webster, and Raymond A. Yourd, III, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 446,739, Dec. 3, 1982, Pat. No. 4,454,214. This application Mar. 12, 1984, Ser. No. 588,605
Int. Cl.³ G03G 13/20
U.S. Cl. 430—99 5 Claims

1. A method of imaging which comprises forming a negative electrostatic latent image on a photoresponsive imaging device, contacting the resulting image with a positively charged toner composition comprised of resin particles, pigment particles, and from about 0.1 percent by weight to about 10 percent by weight of a pyridinium tetrafluoroborate charge enhancing additive of the formula



wherein R_1 is an alkyl group containing from about 1 carbon atom to about 22 carbon atoms, followed by subsequently transferring the developed image to a suitable substrate, and permanently affixing the image thereto with a fuser roll con-

taining lead oxide and a vinylidene fluoride hexafluoropropylene copolymer thereon.

4,482,621

TWO-COMPONENT TYPE DRY DEVELOPER

Michio Kashiwagi, Otsu, Japan, assignor to Toray Industries, Inc., Japan

Filed Apr. 11, 1983, Ser. No. 483,517
Claims priority, application Japan, May 17, 1982, 57-81504
Int. Cl.³ G03G 9/10
U.S. Cl. 430—107 49 Claims

1. A two-component type dry developer consisting essentially of a mixture of a toner and a magnetic carrier,

said toner containing resin as its principal component and being contained in the developer in the range of from 0.5 to 50 weight percent,

said carrier being consisted of one member selected from the group consisting of metal, metallic oxide and ferrite, having a specific surface area of 100 to 300 cm^2/g, a shape factor of not less than 5.5×10^{-2} and less than 8.0×10^{-2} and a product of flowability and true specific gravity of 100 to 190 sec/50 g and being contained in the developer in the range of from 50 to 99.5 weight percent.

4,482,622

MULTISTAGE DEPOSITION PROCESS

Philip H. Soden, Oakville, and Paul S. Vincett, Grand Valley, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1983, Ser. No. 480,642
Int. Cl.³ G03G 5/04; C09D 5/24
U.S. Cl. 430—135 8 Claims

1. A process for depositing particles in a softenable layer to form a migration imaging member comprising heating at least the surface of said layer to soften said surface, contacting said surface in a first deposition zone at a high impingement rate with vapors comprising selenium or selenium alloy vapors from a selenium or selenium alloy source to form a sub-surface monolayer of spherical particles comprising said selenium or selenium alloys, removing said surface from said first deposition zone prior to substantial dropoff in optical density, contacting said surface in at least one second deposition zone longer than said first deposition zone at an impingement rate with said selenium or selenium alloy vapors of less than about one-half the impingement rate in said first deposition zone to increase the size of said spherical particles while maintaining a narrow size distribution of said spherical particles and achieving a high surface packing density thereby increasing the optical density of said migration imaging member, and removing said surface from said second deposition zone prior to substantial dropoff in optical density.

4,482,623

PREPARATION METHOD OF MAGNETIC TONER

Kazunori Tabaru; Takafumi Aoyama, both of Kumagaya, and Toshio Kumakura, Ohmiya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 132,082, Mar. 20, 1980, abandoned, which is a continuation-in-part of Ser. No. 940,647, Sep. 8, 1978, abandoned. This application Oct. 1, 1981, Ser. No. 307,509
Claims priority, application Japan, Sep. 9, 1977, 52-107711; Sep. 22, 1977, 52-113336
Int. Cl.³ G03G 9/14
U.S. Cl. 430—137 9 Claims

1. In the method of making single component magnetic toners of the type composed of fine magnetic particles, carbon black, and an organic binder, the method including the steps of uniformly mixing the magnetic particles and the binding component, pulverizing the mixed material to a preselected range of particle diameters to form a toner powder mass, mixing the carbon black with the powder mass, thermally fixing the carbon black on the surfaces of the particles comprising the powder mass, and grading the powder mass according to its electric resistivity, the improvement comprising measuring the resistivity under substantially no-load conditions, said measuring step being carried out in a measuring device having a toner-receiving cavity and further including the sub-steps of (a) pouring the powder mass into the cavity, (b) inserting a pair of spaced-apart electrodes into the poured powder mass, (c) applying an electric potential below about 20 volts D.C./cm of separation across the spaced-apart electrodes, and (d) adjusting the measured resistivity to determine the volume resistivity of the powder mass, and wherein the grading step includes selecting a powder mass having a resistivity ranging from about 1.66×10^3 to about 1.66×10^6 ohm.cm as determined by said measuring step.

4,482,624

PHOTOSENSITIVE MATERIAL EMPLOYING ENCAPSULATED RADIATION SENSITIVE COMPOSITION AND PROCESS FOR IMPROVING SENSITIVITY BY SEQUESTERING OXYGEN

Jonathan S. Arney; Richard F. Wright; Paul C. Adair, and Dennis L. Williams, all of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 15, 1983, Ser. No. 466,704
Int. Cl.³ G03C 1/40, 1/00
U.S. Cl. 430—138 25 Claims

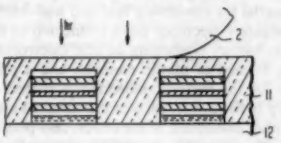
1. A photosensitive material comprising a support having on a surface thereof a photosensitive layer including an image forming agent and a plurality of capsules, said capsules containing, as the internal phase, a radiation sensitive composition which undergoes a change in viscosity upon exposure to actinic radiation, said radiation sensitive composition including a photoinitiator and an agent different than said photoinitiator which sequesters oxygen in response to exposure which does not substantially change the viscosity of said radiation sensitive composition, said image forming agent being associated with said capsules such that by rupturing said capsules and releasing said internal phase said image forming agent is activated.

4,482,625

PROCESS FOR PREPARING A COLOR PROOFING SHEET

Tomizo Namiki; Tomohisa Tago; Mikio Totsuka, and Fumiaki Shinozaki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 28, 1983, Ser. No. 555,736
Claims priority, application Japan, Nov. 26, 1982, 57-207342
Int. Cl.³ G03C 1/54, 5/08
U.S. Cl. 430—143 13 Claims



1. A process for preparing a color proofing sheet, which comprises imagewise exposing a light-sensitive image-forming material comprising a transparent support having provided thereon a dye- or pigment-containing light-sensitive photoresist composition layer or both a dye- or pigment-containing colorant layer and a light-sensitive photoresist composition layer through a color separation mask, developing the material to form a color separation image, transferring the color separation image onto a photopolymerizable image-receiving layer, transferring in registration at least one more color separation image onto the same image-receiving layer to obtain a multicolored color proofing sheet on a single support, and totally

exposing the image-receiving layer after the image transfer in an amount sufficient to induce photopolymerization thereof.

4,482,626

PHOTOGRAPHIC COLOR DEVELOPER COMPOSITIONS

Peter J. Twist, Great Missenden; Joseph Bailey, Bushey Heath; Stuart P. Briggs, London; Miroslav V. Mijovic, Watford, and David T. Southby, Rayners Lane, all of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 474,772, Mar. 14, 1983, abandoned. This application Mar. 30, 1984, Ser. No. 594,945

Claims priority, application United Kingdom, Apr. 29, 1982, 8212463

Int. Cl.³ G03C *5/30*

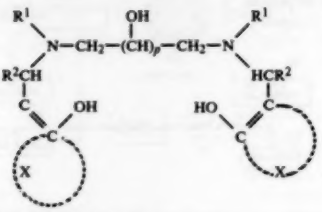
U.S. Cl. 430—380 **30 Claims**

1. A photographic color developing composition comprising:

(1) a primary aromatic amino color developing agent,

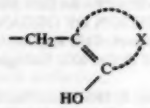
(2) an hydroxylamine, and

(3) a compound of the formula:



wherein

each R^1 is $-CH_2COOH$ or



each R^2 is hydrogen or —COOH

p is 0 or 1, and

X represents the atoms necessary to complete an aromatic nucleus.

4,482,627

METHOD OF TREATING DIRECT POSITIVE SILVER HALIDE SENSITIVE MATERIAL

Yoshihiro Takagi; Shigeo Hirano, and Tadao Sugimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 14, 1983, Ser. No. 484,812

Claims priority, application Japan, Apr. 16, 1982, 57-63603

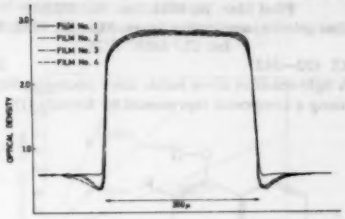
Int. Cl.³ G03C *5/24, 1/06*

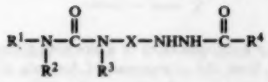
U.S. Cl. 430—410 **21 Claims**

1. A method of treatment for forming a direct positive image comprising the steps of:

providing a direct positive silver halide photosensitive material which has been imagewise exposed to light and which is comprised of a base having thereon a fogging compound represented by the general formula (I), and an inner latent image type sensitive silver halide photographic emulsion layer not previously fogged; and

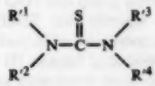
developing the material thereby forming a direct-positive image in the presence of a compound represented by the general formula (II):





(I)

wherein R^1 and R^2 independently represent a hydrogen atom, an aliphatic residue, an aromatic residue or a heterocyclic residue, R^3 represents a hydrogen atom or an aliphatic residue, R^4 represents a hydrogen atom, an aliphatic residue or an aromatic residue, and X represents a divalent aromatic residue;



(II)

wherein R'^1, R'^2, R'^3 and R'^4 independently represent an alkyl group which may be substituted, an alkenyl group or an aryl group which may be substituted, and R'^1 and R'^2, R'^2 and R'^3 or R'^3 and R'^4 may form a 5- or 6-member heterocyclic ring, said compound represented by the general formula (II) is present in an amount sufficient to improve the sharpness and edge effect of said direct-positive image.

4,482,628

PHOTOGRAPHIC PAPER CONTAINING MAGNESIUM OXIDE

Toru Katsura, and Massashi Kubbota, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,450

Claims priority, application Japan, Sep. 19, 1979, 54/120489

Int. Cl.³ G03C *1/78*

U.S. Cl. 430—538 **1 Claim**

1. A photographic paper of reduced unfavorable influence on photographic properties comprising (A) a photographic paper support material which is made of a web containing at least one cationic material selected from the group consisting of cationic sizing agents, cationic strength agents, cationic fixing agents, and cationic retention aids, and (B) a photographic silver halide emulsion coated thereon, wherein said web contains therein magnesium oxide in an amount of 0.1–3.00% by based on the weight of the paper pulp in the web, as a photographic properties-improving agent which can reduce unfavorable influence on said photographic silver halide emulsion caused by said cationic material.

4,482,629

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Satoshi Nakagawa; Hiroshi Sugita; Shuzi Kida; Morito Uemura, all of Hino, and Ken-ichi Kishi, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,857

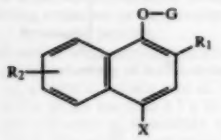
Claims priority, application Japan, Mar. 20, 1982, 57-45809

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—542 **20 Claims**

1. A light-sensitive silver halide color photographic material containing a compound represented by formula (I):

Formula (I)



wherein G is a hydrogen atom or a blocking group which is eliminated from the compound of formula (I) through hydrolysis or intramolecular nucleophilic substitution during development; R_1 is an organic group having up to 16 carbon atoms and at least one substituent selected from the group consisting of carboxyl, sulfo and hydroxyl, which may also form a salt; R_2 is a hydrogen atom or a water soluble acidic group; and X is

(a) a development accelerator group; or

(b) a TIME-PUG group;

wherein TIME is a timing group and PUG is a photographically useful group wherein said TIME-PUG group is eliminated from the compound of formula (I) through the reaction of the compound of formula (I) with an oxidized product of a color forming developing agent and thereafter the PUG group can be released from said TIME-PUG group, said compound of formula (I) and a cyan dye formed through the reaction of said compound with said oxidized product of said color forming developing agent being soluble in alkali.

4,482,630

SILICONATE-COATED ENZYME

Edwin Allen, Oupeye; Alan Dillarstone, Rocourt, and Joseph A. Reul, Heusy, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 366,713, Apr. 8, 1982, Pat. No. 4,421,657. This application Nov. 21, 1983, Ser. No. 554,094

Int. Cl.³ C09K *3/18*; C11D *3/386, 17/06*

U.S. Cl. 435—187 **2 Claims**

1. Particles of enzyme of sizes in the range of No's. 10 to 200, U.S. Sieve Series, at least partially coated with a salt of a lower alkyl siliconic acid and/or polymerization product(s) thereof formed therefrom on storage.

2. Enzyme particles according to claim 1 which are coated with from 0.05 to 1% of potassium methyl siliconate.

4,482,631

Patent Not Issued For This Number

4,482,632

MICROBIOLOGICAL PROCESS FOR REMOVING OLEAGINOUS MATERIAL FROM WASTEWATER AND MICROBIOLOGICAL COMBINATION CAPABLE OF SAME

Philip W. Spraker, assignor to Sybron Corp., Rochester, N.Y.

Continuation of Ser. No. 261,394, May 7, 1981, Pat. No. 4,350,770, which is a continuation of Ser. No. 4,241, Jan. 17, 1979, Pat. No. 4,288,545. This application Apr. 23, 1982, Ser. No. 371,169

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ C12N *1/20*

U.S. Cl. 435—253 **1 Claim**

1. A microorganism of the strain *Pseudomonas aeruginosa* $SGRR_2$ (ATCC-31480) capable of utilizing oleaginous materials of animal origin or containing the same as an assimilable source of carbon.

4,482,633

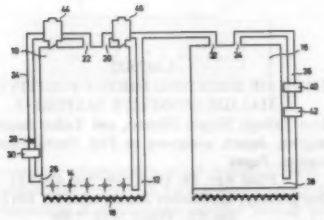
METHOD AND APPARATUS FOR AEROBIC DECOMPOSITION OF ORGANIC SOLIDS

Hanns Roediger, Stuttgart, Fed. Rep. of Germany, assignor to Techtransfer GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Jan. 5, 1982, Ser. No. 337,293

Int. Cl.³ C12M *1/12*

U.S. Cl. 435—311 **18 Claims**



1. An apparatus for the aerobic decomposition of organic solids comprising a decomposition tower, support surface means near the bottom of said tower, said support surface means comprising a roller grid as well as means for resupplying of discharged solids to the decomposition tower for mixing the material to be decomposed with dried material previously being decomposed,

a duct leading from the top of said decomposition tower and introduced on a lower located point into the decomposition tower serving to achieve a closed circuit for the fluid having passed said decomposition tower and for withdrawing from the top and recycling back into the lower portion of said decomposition tower, said duct including means for circulating the fluid, said decomposition tower including at least one closeable exhaust air device having means for cleaning the exhaust air, said cleaning means including a chamber having an inlet at one end thereof and an outlet at the opposite end, a deflector plate disposed in said chamber and a filter means extending between said deflector plate and said outlet, means located adjacent said outlet for wetting said filter means, said chamber having a drain conduit at the end thereof adjacent said inlet.

4,482,634

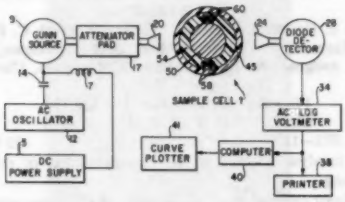
CHEMICAL FLOOD TESTING METHOD

Lorne A. Davis, Jr.; Dale F. Brost, and Helen K. Haskin, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,136

Int. Cl.³ E21B *49/02*

U.S. Cl. 436—31 **26 Claims**



1. A method of testing a surfactant for use in an enhanced oil recovery operation of a crude oil reservoir in an earth formation comprising the steps of:

obtaining at least one core of an earth formation,

cleaning said core,

subjecting said core to a predetermined sequence of events similar to that which the reservoir has experienced,

floodng the core with surfactant,

driving the surfactant from the core with at least one drive liquid,

irradiating the core with a beam of microwave energy so that a portion of the beam of microwave energy passes through the core,

detecting the portion of the beam of microwave energy that has passed through the core, and

deriving an indication of the effectiveness of the surfactant in accordance with the detection of the portion of the beam of microwave energy.

4,482,635

COMPOSITION, INDICATOR, PROCESS AND DEVICE FOR DETECTING CARBON MONOXIDE

Thomas Herskovitz, Wilmington, and William G. Peet, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

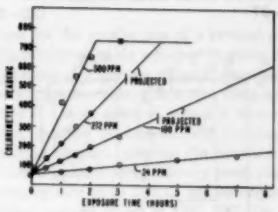
Continuation of Ser. No. 363,283, Mar. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 236,245, Feb. 20, 1981, abandoned. This application Sep. 22, 1983, Ser. No. 534,779

Int. Cl.³ G01N *21/25*; G01J *1/50*

U.S. Cl. 436—134 **9 Claims**

1. An improved CO indicating composition consisting essentially of silica having dispersed thereon dry residues resulting from the silica having been impregnated with a solution of palladium sulfate, sulfuric acid and ammonium molybdate, the improvement comprising that the silica is fumed silica, said composition (a) having a gram-atom ratio of Mo/Pd of from about 0.1:1 to about 350:1 and a ratio of moles of SiO_2/gram atoms of Pd of from about 10:1 to about 5000:1 and (b) being capable of preferentially absorbing CO from ambient air to give a color change and then later being extracted to give an aqueous extract of colored material which is a quantitative measure of ambient CO concentration.

4. A process for detecting carbon monoxide comprising



exposing ambient air first to a drying agent and then to the indicating composition of claim 1, whereby a color change is effected in said composition proportional to the carbon monoxide content of said air, treating the exposed composition with an extraction medium selected from water and an aqueous buffer solution having a pH of from about 5 to about 12 in order to extract colored material from said composition, separating the resulting extract from the solids of the composition, and measuring color depth in the extract with a colorimeter.

4,482,636

METHOD FOR REACTING SOLID AND LIQUID PHASES

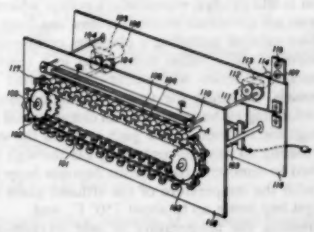
Ei Mochida; Takashi Kudo, both of Tokyo; Toshiyuki Sugawara, Saitama, and Minoru Tsumura, Tokyo, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,903

Claims priority, application Japan, Aug. 27, 1981, 56-134534

Int. Cl.³ G01N *33/56, 33/58, 33/60*; B01F *9/00*

U.S. Cl. 436—518 **29 Claims**

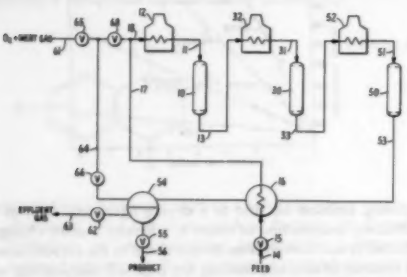


1. A method of reacting a first reactive substance bound to the inner wall surface of a reaction vessel and a second reactive substance in a liquid phase, said method comprising placing a liquid containing said second reactive substance in said reaction vessel and rotating said reaction vessel about its axis at a speed of 10 to 100 rpm, while said reaction vessel is kept inclined at an angle between 5° and 45° above the horizontal.

4,482,637
IN SITU HYDROCARBON CONVERSION CATALYST REGENERATION AND SULFUR DECONTAMINATION OF VESSELS COMMUNICATING WITH CATALYST REACTOR

Waldeen C. Buss, Richmond, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 4, 1982, Ser. No. 405,149
Int. Cl.³ B01J *23/96*; C10G *35/095*
U.S. Cl. 502—37 **17 Claims**



1. In a process of regenerating in situ a fixed bed of platinum- and rhenium-containing alumina-base reforming catalyst containing carbonaceous deposits in a reforming system including sulfur-contaminated vessels and/or conduits in flow communication with said fixed catalyst bed, the improvement which comprises using the reforming flow path without change through said vessels and/or conduits and fixed catalyst bed, passing an oxygen-containing gas through said sulfur-contaminated vessels and/or conduits and the bed of catalyst in the reactor at a temperature of not more than 750° F. whereby said carbonaceous deposits are burned off of said catalyst, then after substantially all of the carbonaceous deposits are removed, increasing the temperature of said oxygen-containing gas to a range of 750°-900° F. to oxidize the sulfur in said contaminated vessels and/or conduits and/or said catalyst to sulfur dioxide to permit removal therefrom with minimum conversion to sulfur trioxide which tends to react with the catalyst, and after substantially all the sulfur contaminants are removed, continuing the flow of oxygen-containing gas with the temperature increased to above about 900° F. to redisperse the platinum on the surface of the alumina base without substantial displacement of the rhenium from the alumina base.

7. The process of claim **1** wherein after the sulfur removal step said regenerating gas temperature is raised to a range of 900° to 950° F. and a chloride component is added to the circulated gas.

17. In an in situ catalyst regeneration system wherein regeneration gases are circulated through at least one fixed bed of an alumina-base catalyst including a platinum component, a rhenium compnent and a halide component in a reactor vessel interconnected in series with sulfur-contaminated conduits, and/or vessels, including the vessel containing said catalyst bed, in a reforming system and wherein conventional regeneration through the reforming flow path includes the steps of

(a) circulating an oxygen-containing gas through said catalyst bed to remove carbonaceous deposits from said catalyst with the temperature of the effluent gases from said catalyst bed being up to about 750° F., and

(b) increasing the temperature of said oxygen-containing circulating gas to above about 900° F. to facilitate redispersion of said platinum component over the alumina surface,

the improvement which comprises after step (a) has been continued until the carbonaceous deposits are substantially removed and before step (b) continuing the flow of said oxygen-containing gas through said catalyst bed and said sulfur-contaminated conduits and/or vessels at a temperature of from about 750° F. to 900° F. at the inner surface of said conduits and/or vessels and until the sulfur content of said catalyst is less than about 0.3 weight percent with minimum conversion to sulfur trioxide whereby step (b) is then completed without substantial displacement of the rhenium component from the alumina base.

4,482,638
IN SITU PROCESS FOR PRODUCING AN ALPHA OLEFIN POLYMERIZATION CATALYST COMPONENT

Richard W. Fries, Joliet, Ill., assignor to Northern Petrochemical Company, Omaha, Nebr.

Filed Jul. 14, 1983, Ser. No. 513,766
Int. Cl.³ C08F *4/64*
U.S. Cl. 502—108 **10 Claims**

1. A process for producing, in situ and without milling or grinding, an alpha olefin polymerization catalyst component which consists of:

(a) Adding an olefin to a titanium halide, and

(b) Adding an electron donor to the mixture of (a).

4,482,639
CATALYSTS FOR THE POLYMERIZATION OF ETHYLENE

Michael J. Desmond, Cleveland Heights; Kenneth C. Benton, and Raymond J. Weinert, both of Garfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 15, 1982, Ser. No. 418,320
Int. Cl.³ C08F *4/62, 4/64, 4/68, 4/70*
U.S. Cl. 502—117 **32 Claims**

1. A catalyst system for the polymerization of ethylene comprising:

(a) at least one transition metal complex of at least one binucleating ligand, which attaches to at least one nucleus containing at least one transition metal element of Atomic No. 22 through 30 of the Periodic Table of Elements, and

(b) an organometallic compound containing at least one element of Group IA, Group IIA or Group IIIA of the Periodic Table of Elements.

4,482,640
ETHYLENE OLIGOMERIZATION

Ronald D. Knudsen, and Stephen E. Reiter, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1983, Ser. No. 490,596
Int. Cl.³ B01J *31/04*
U.S. Cl. 502—155 **12 Claims**

1. A composition consisting essentially of:

(a) at least one nickel compound selected from the group consisting of:

bis(1,5-cyclooctadiene)nickel(O),

bis(tricyclohexylphosphine)nickel(O),

nickel tetracarbonyl,

(cyclododecatriene)nickel, and

bis(ethylene)(dicyclohexylphosphine)nickel;

(b) a phosphine compound of the formula PR_3 wherein R represents H or a C_1 to C_{20} hydrocarbyl radical with the proviso that any alkenyl substitution be at least 3 carbon atoms removed from the phosphorus atom and at least one R is not H; and

(c) an acid selected from the group consisting of (i) a fluorinated carboxylic acid of the formula R'COOH wherein R' represents a C_1 to C_{10} hydrocarbyl radical having at least 1 fluorine (F) atom, (ii) a dicarboxcyclic acid of the formula $(R'')_2—X—(COOH)_2$ wherein R'' independently represents H or a C_1 to C_{20} hydrocarbyl or fluorinated hydrocarbyl radical and X is a tetravalent C atom or the tetra-substituted benzene radical C_6H_2, (iii) 2-ketobutyric acid and (iv) gly-

cine, such that the molar ratio of (b) to (a) is about 0.01–4.0 to 1 and the molar ratio of (c) to (a) is about 0.01–10.0 to 1.

4,482,641

METAL-CONTAINING ACTIVE CARBON AND METHOD FOR MAKING SAME

Arnold N. Wennerberg, Chicago, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 28, 1983, Ser. No. 470,285
Int. Cl.³ C01B *31/08*; B01J *20/20, 21/18, 23/40*
U.S. Cl. 502—182 **14 Claims**

1. A method for forming a substantially uniform dispersion of a metal or metal oxide in a porous carbon matrix, comprising:

forming a uniform co-crystallite from an aromatic carboxylic or sulfonic acid, phenol, thiol, aromatic amine or salt of any thereof and from a salt or complex of a transition metal or metal from Groups IIIA, IVA or VA of the Periodic Table of Elements;

forming a uniform powdered mixture of the co-crystallite and an alkali metal hydroxide;

pyrolyzing the powdered mixture in an inert atmosphere at a temperature in the range of from about 400° C. to about 980° C. to form the carbon matrix having the metal or metal oxide substantially uniformly dispersed therein; and

separating unreacted inorganic material and inorganic reaction products, other than the dispersed metal or metal oxide, from the carbon matrix to form the porous carbon matrix end product.

6. The method of claim 1 wherein (1) a solution of both of (a) the aromatic carboxylic or sulfonic acid, phenol, thiol, aromatic amine or salt of any thereof and (b) the salt or complex of the transition metal or metal from Groups IIIA, IVA or VA or (2) a solution of the aromatic carboxylic or sulfonic acid, phenol, thiol, aromatic amine or salt of any thereof and a solution of the salt or complex of the transition metal or metal from Groups IIIA, IVA or VA are spray-dried to form the co-crystallite.

12. The method of claim 1 wherein the porous carbon matrix is active carbon having a BET surface area of at least 800 square meters per gram and a bulk density of at least 0.1 gram per cubic centimeter.

4,482,642

PROCESS FOR THE PRODUCTION OF SLUGS OF PYROGENICALLY PRODUCED OXIDES

Manfred Ettlinger, Rodenbach; Horst Ferch, Bruchkobel; Detlev Koth, Grenzach-Wyhlen, and Edgar Simon, Freigericht-Neuses, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,525
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132674
Int. Cl.³ B01J *21/06*
U.S. Cl. 502—232 **17 Claims**

1. A process for the production of a pressed object from a pyrogenically produced oxide which is an oxide of a metal, an oxide of a metalloid or a mixture thereof comprising intensively mixing the pyrogenic oxide with water, silica sol and a polyhydric alcohol as a mold assistant which is ethanediol, glycerine, erythritol, pentitol or hexitol, and forming a flowable powder from the mixture, shaping the flowable powder by pressing to form a pressed object, slowly predrying the pressed object at a temperature up to 100° C. and subsequently tempering the predried pressed object at 450°–700° C.

4,482,643

PREPARATION OF CRYSTALLINE TiO_2 AS ANATASE AND/OR RUTILE IN POROUS CARRIERS

Philip H. Harju, Spring Church, and Kenneth R. Call, Pittsburgh, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 26, 1982, Ser. No. 401,829
Int. Cl.³ B01J *21/06, 21/08*
U.S. Cl. 502—242 **13 Claims**

1. A method of forming titanium dioxide in a selected polymorphic form or in a selected proportion of polymorphic forms on a porous carrier which comprises:

impregnating a carrier with a partially hydrolyzed aqueous methanol solution of titanium tetrachloride and thereafter completing the hydrolysis of the titanium tetrachloride under controlled conditions to obtain a selected polymorphic form or a selected proportion or polymorphic forms of titanium dioxide, wherein the rate of hydrolysis is controlled such that low rates produce anatase and high rates produce rutile.

4,482,644

OXYGEN-DEFICIENT, BARIUM-CONTAINING PEROVSKITES

Robert A. Beyerlein, Westfield; Allan J. Jacobson, Princeton, and Kenneth R. Poeppelmeier, Flemington, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 18, 1983, Ser. No. 485,708
Int. Cl.³ B01J *23/02, 23/10, 23/18*
U.S. Cl. 502—303 **20 Claims**

1. An oxygen-deficient, barium-containing compound having a perovskite-type structure of the formula:

$$Ba_2M_aM'_{2-a}O_{5+y}$$

if M is a trivalent cation, or

$$Ba_3M_aM'_{3-a}O_{[7.5-(a/2)+y]}$$

if M is a divalent cation, wherein M is selected from the group consisting of Mg, Ca, Sr, Ba, Sc, Y, La, the lanthanides of atomic number 58 or greater, Ni, Fe, Cu, Al, Ga, In, Zn, Cd, Hg, Bi, Tl and a mixture thereof, M' is selected from the group consisting of Sb or Bi, a is equal to or greater than 0 but less than or equal to 1, and if M is a trivalent cation, y is equal to or greater than 0 but less than 1, and if M is a divalent cation, y is equal to or greater than 0 but less than (3+a)/2.

4,482,645

METHOD OF MAKING AN IRON OXIDECHROMIUM OXIDE CATALYST

James R. Jennings, Yarm, England, and George N. Pessimisis, Westchester, Ill., assignors to Imperial Chemical Industries Limited, London, England and Katalco Corporation, Oak Brook, Ill.

Division of Ser. No. 380,979, May 24, 1983,. This application Aug. 1, 1983, Ser. No. 519,151
Int. Cl.³ B01J 23/86
U.S. Cl. 502—316 5 Claims

1. A method of making an iron-chromium oxide composition having a Fe_2O_3/Cr_2O_3 weight ratio of 20:1 to 6:1, a surface area of 100–250 m^2/g, a mean pore radius of 10–100 A, and a loss on ignition of over 10 weight percent, said composition convertible by reduction to a catalyst for the high temperature shift process, said method comprising:

A. Dissolving a spent iron oxide-chromium oxide shift catalyst having a Fe_2O_3/Cr_2O_3 ratio of 20:1 to 6:1 in nitric acid;

B. Separating the resulting solution of the nitrates of iron and chromium from the nitric acid insoluble residue containing undissolved iron and chromium components;

C. Dissolving the nitric acid insoluble residue of step B in sulphuric acid to obtain a solution of metal sulphates;

D. Reacting the resulting metal sulphate solution with a source of nitrate ions and of cations of which the sulphate is of low solubility so as to prepare a solution of iron and chromium nitrates and an insoluble sulphate precipitate;

E. Separating the insoluble sulphate precipitate from the solution of metal nitrates to give a nitrates solution of iron and chromium low in sulphate content;

F. Combining the solutions of the nitrates of iron and chromium of steps B and E;

G. Reacting the resulting iron and chromium nitrate solution with an alkali metal carbonate to co-precipitate the hydroxides of iron and chromium;

H. Separating the insoluble iron and chromium hydroxide precipitate;

I. Washing the iron and chromium hydroxide precipitate to decrease its alkali metal content to under 0.4% calculated as equivalent Na_2O;

J. Drying such precipitate and thermally decomposing the iron and chromium hydroxides to oxides; and then,

K. Forming the precipitate into pieces having dimensions in range 2–20 mm, with no dimension of a single piece more than 5 times another.

4,482,646

OXIDATIVE DEHYDROGENATION OF PARAFFINS

Alan D. Eastman, and James B. Kimble, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 487,366, Apr. 21, 1983, Pat. No. 4,450,313. This application Mar. 5, 1984, Ser. No. 586,503
Int. Cl.³ B01J 23/02
U.S. Cl. 502—324 4 Claims

1. A catalyst composition comprising lithium and titanium, wherein the atomic ratio of lithium to titanium is above about 1.8:1.

4,482,647

MANUFACTURE OF OXYGENATED COMPOUNDS

David W. Smith, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 326,978, Dec. 3, 1981, abandoned, which is a continuation of Ser. No. 142,284, Apr. 21, 1980, abandoned. This application Jan. 25, 1984, Ser. No. 573,538
Int. Cl.³ C07C 27/06, 31/08
U.S. Cl. 518—701 28 Claims

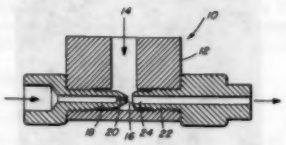
1. A process for forming acetaldehyde in a first stage reaction and then reducing said aldehyde to form ethanol in a second stage reaction which comprises reacting carbon monoxide and hydrogen at a temperature of from about 150° to about 300° C. and at superatmospheric pressure in the presence of a liquid catalyst system consisting of a rhodium carbonyl halide or a combination of a rhodium carbonyl complex and a separate source of halide selected from the group consisting of hydrogen halides in a solvent in which said catalyst components are dissolved at least during said first reaction stage, then catalytically reducing said formed acetaldehyde and recovering ethanol as the principal product.

4,482,648

FOAMED INK COMPOSITION AND METHOD OF MAKING THE SAME

Edward C. Norman, Chester Springs, Pa., assignor to Foamink Company, Inc., Fall River, Mass.

Continuation-in-part of Ser. No. 360,757, Mar. 22, 1982, abandoned. This application Sep. 17, 1982, Ser. No. 419,232
Int. Cl.³ C08J 9/30
U.S. Cl. 521—65 31 Claims



1. In a liquid ink composition for use in printing on a paper-like substrate comprising a synthetic resin, a pigment and a foaming agent, the improvement which comprises:

a polysacharride admixed in an amount of 0.02–0.50% solids by weight and said liquid composition in an amount sufficient to impart to said composition pseudoplastic properties such that when said composition is subjected to shear, the viscosity of said liquid composition is reduced by a factor of between 10–20,000 measured at a shear rate of 1,000 seconds^{-1}, whereupon when said liquid composition is converted to a foam and said foam is thereafter subjected to mechanical shear, the pseudoplastic properties of the liquid composition in the foam bubble walls control the foam stability and fluidity to thereby inhibit collapse of the foam.

4,482,649

PLASTICS CELLULAR MATERIAL AND METHOD OF MAKING

Alexander Miutel, and Jerry P. Shira, both of Toronto, Canada, assignors to Phoenix Foam Inc., Toronto, Canada

Filed Feb. 21, 1984, Ser. No. 581,590
Int. Cl.³ C08V 9/06
U.S. Cl. 521—86 9 Claims

1. In a process for production of a plastics cellular material, having a resin binding, from a first mixture of an unsaturated fast curing polyester resin; copolymerizeable monomers; a finely dispersed gas releasing salt; hardening accelerators; finely dispersed surfactants; fillers; and a second mixture consisting of an acidic solution for reaction with the gas releasing salt as a blowing agent; and organic catalysts; the two said

mixtures being combined to form a third mixture that will foam in a controllable manner and cure to produce a foam material, as aforesaid, the improvements of:

adding to the said first mixture epoxy based vinyl esters for strength of the said plastics cellular material.

4,482,650

BLOWING AGENT COMPOSITIONS

Donald G. Rowland, Woodbridge, and Rhomie L. Heck, III, Naugatuck, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 399,518, Jul. 19, 1982,. This application Jan. 23, 1984, Ser. No. 573,246

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.[3] C08J *9/10*

U.S. Cl. 521—89 **2 Claims**

1. A masterbatched blowing agent composition for foaming a polymeric composition consisting essentially of:

(a) azodicarbonamide;

(b) zinc oxide, zinc carbonate or a zinc salt of C_1–C_4 organic acid; and

(c) an aromatic sulfinic acid or a metal salt of an aromatic sulfinic acid,

wherein for each 100 parts by weight of (a), (b) is 0.25–25 parts by weight and (c) is from 1–2000 parts by weight per 100 parts of (b) and the total of (b)+(c) is from 2–25 parts by weight and substantially in the absence of the polymeric composition to be foamed fully comprising a trimethylolpropane trimethacrylate peroxide promoter.

4,482,651

PROCESS FOR THE PREPARATION OF HALOALKOXYMETHYLMELAMINE ADDUCT DISPERSIONS AND POLYURETHANE COMPOSITIONS PREPARED THEREFROM

Curtis J. Reichel; John T. Patton, Jr., both of Wyandotte, and Thirumurti Narayan, Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 1, 1982, Ser. No. 445,817

Int. Cl.[3] C08G *18/14, 18/38*

U.S. Cl. 521—115 **9 Claims**

1. A process for the preparation of a solid haloalkoxymethylmelamine adduct reacting (a) hexamethoxymethylmelamine, (b) a halogenated alcohol containing from 2 to 20 carbon atoms, and at least 1 halogen atom, at temperatures from 25° C. to 120° C., in an organic solvent, in the presence of an acid catalyst, and (c) removing the solid adduct from solution wherein the mole ratio of halogenated alcohol to melamine is from 1:1 to less than 6:1.

4,482,652

MARINE ANTI-FOULING PAINTS

Vijay J. Datta, Louisville, Ky., assignor to Grow Group, Inc., Louisville, Ky.

Filed Dec. 1, 1980, Ser. No. 211,509

Int. Cl.[3] C08K *3/10;* C08L *33/00*

U.S. Cl. 523—122 **8 Claims**

1. A coating composition having an improved rate of ablation and improved still water anti-fouling properties comprising:

(a) a film-forming copolymer containing about 25 to about 80 percent by weight based on the total coating composition of an organotin monomer having the general formula $R_3SnOOCCR'{=}CHR''$, wherein R is the same or different alkyl radical containing up to 8 carbon atoms, an aryl or an aralkyl group; R′ is hydrogen or a methyl group and R″ is hydrogen or a —$COOSnR_3$ group, the balance of the copolymer based on alpha beta ethylenically unsaturated monomers copolymerizable therewith;

(b) about 2.5 to about 40 percent by weight on the same basis of a basic copper sulfate; and

(c) about 10 to about 50 percent by weight on the same basis of a water-insoluble pigment or filler.

4,482,653

CYCLOPENTADIENE DERIVATIVES, METHOD FOR PREPARING, AND USE THEREOF

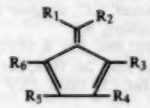
Bruce A. Gruber, Worthington; Diether Koch, Dublin; Heimo J. Langer, and William R. Dunnavant, both of Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 300,786, Sep. 10, 1981, Pat. No. 4,412,088. This application Aug. 5, 1983, Ser. No. 520,660

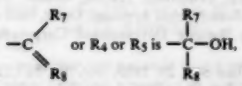
Int. Cl.[3] C08K *3/10, 3/22, 3/26;* C08L *61/00*

U.S. Cl. 523—144 **20 Claims**

1. A composition containing at least one derivative of the formula



wherein each R_1 and R_2 individually is a hydrocarbon containing 1 to 10 carbon atoms or a hydrocarbon containing one or more oxygen bridges in the chain and containing up to 10 carbon atoms, or a furyl group; or are interconnected and together with the carbon atom to which they are connected form a cycloaliphatic hydrocarbon group or one of R_1 or R_2 is hydrogen and wherein each R_3, R_4, R_5, and R_6 individually is hydrogen or methyl or



and provided that a maximum of only one such R_3, R_4, R_5 and R_6 is methyl and provided that one such R_3, R_4, R_5 and R_6 is

wherein each R_7 and R_8 individually is a hydrocarbon group containing 1–10 carbon atoms, or a hydrocarbon containing one or more oxygen bridges in the chain and containing up to 10 carbon atoms, or are interconnected and together with the carbon atom to which they are connected form a cycloaliphatic hydrocarbon group; or one of R_7 or R_8 is hydrogen; or isomer thereof, or prepolymer thereof, or mixture thereof; and a effective catalytic amount of an acidic catalyst having a pka of about 4 or less.

3. The molding composition of claim 1 which is a foundry composition containing up to about 10% by weight of the aggregate of the composition of claim 1.

4,482,654

BINDER COATED FOUNDRY SAND GRAINS

Kazuyuki Nishikawa, Toyohashi; Katsumi Hirao, Akashi; Kazuhiko Mizuguchi, Yokohama, and Hiroshi Suzuki, Okazaki, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai and Shinto Kogio Ltd., Nagoya, both of, Japan

Continuation of Ser. No. 250,489, Apr. 2, 1981, abandoned. This application Jan. 20, 1983, Ser. No. 459,569

Claims priority, application Japan, Apr. 11, 1980, 55-47580

Int. Cl.³ B28B *7/34*

U.S. Cl. 523—145 6 Claims

1. Grains of foundry sand coated with a binder composition, said binder composition consisting essentially of a mixture of (A) 10 parts by weight of a material selected from the group consisting of methylolmelamine and alkylated methylolmelamine, and (B) from 5 to 100 parts by weight of a water-soluble organic material selected from the group consisting of glycerin, diglycerin, propylene glycol, hydroxyethyl cellulose, sodium carboxymethyl cellulose, water-soluble cellulose acetate and mixtures thereof, the amount of said binder composition being in the range of from 1.5 to 5 parts by weight per 100 parts by weight of said grains of sand, said coated grains of sand having been prepared by kneading a mixture of sand grains and a solution of said binder composition in a solvent and then removing the solvent to obtain dry coated sand grains.

4,482,655

COMMINUTED INORGANIC MATERIALS

Michael E. Wilson, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 157,880, Jun. 9, 1981, Pat. No. 4,328,041. This application Aug. 26, 1981, Ser. No. 296,389

Int. Cl.³ C08K *5/09*

U.S. Cl. 523—200 5 Claims

1. A filled polymeric composition which comprises a natural or synthetic polymer containing therein a filler treated with a substituted succinic anhydride.

4,482,656

METHOD FOR MANUFACTURING A COMPOSITION FOR COATING SUBSTRATES WITH AN ABRASION-RESISTANT TRANSPARENT AND TRANSLUCENT FILM

Van T. Nguyen, Cruseilles, France; Günter Bellmann, Commugny, and Jean-Michel Armanet, Onex, both of Switzerland, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Sep. 29, 1983, Ser. No. 537,215

Int. Cl.³ C08K *3/10, 3/36, 9/06*

U.S. Cl. 523—212 18 Claims

1. A process for producing a mineral charge of finely divided silica or alumina having organophilic substituents comprising:

(a) hydrolyzing in a hydrolysis medium a di- or trialkoxysilane of formula

$$(RO)_{3-n}SiR^1r_n^2 \quad (I)$$

in which R represents identical or different lower alkyls and R^1 and R^2 are identical or different and selected from the group consisting of alkyl, cycloalkyl, alkylated cycloalkyl, amino alkyl, alkyl amine, alkoxy, alkoxy alkyl, epoxy alkyl, epoxy cycloalkyl, alkenyl, glycidoxy, acryloxy alkyl, methacryloxy alkyl, gamma-ureidopropyl, gamma-chloropropyl, gamma-mercaptopropyl groups, n being 0 or 1,

said hydrolysis providing a corresponding di- or trihydroxy silane of formula

$$(HO)_{3-n}SiR^1R_n^2 \quad (II)$$

in solution in the hydrolysis medium;

(b) adding thereto a proportion of mineral particles of finely divided alumina or silica whereby compound II will react with said particles thus providing graft particles;

(c) homogenizing the resultant mixture so as to provide a homogeneous dispersion of said graft particles in said medium;

(d) spray-drying said homogeneous dispersion, thus forming a powdered substantially dry grafted mineral charge.

4,482,657

SILICA-POLYMER MIXTURES

Erhardt Fischer, and Douglas C. Edwards, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Jul. 12, 1983, Ser. No. 513,089

Claims priority, application Canada, Sep. 1, 1982, 410560

Int. Cl.³ C08K *3/36*

U.S. Cl. 523—334 8 Claims

1. A process for producing a silica-synthetic polymer mixture, which process comprises in combination the steps of:

(a) mixing (i) from about 7 to about 15 parts by weight of silica having an average particle size of from about 10 nm to about 100 nm with (ii) from about 84 to about 93 parts by weight of water and with (iii) from about 0.1 to about 1 part by weight of alkyl trimethylammonium bromide or chloride wherein the alkyl group contains from 8 to 20 carbon atoms, for a total of 100 parts by weight, such mixing being under conditions of low speed agitation, to form a dispersion of silica in water,

(b) adding said dispersion of silica to a latex of a synthetic conjugated C_4–C_6 diolefin containing polymer under conditions of low speed agitation, the ratio of said dispersion of silica to said latex being such as to provide a weight ratio of silica to polymer of from about 25:100 to about 90:100, said latex containing from about 10 to about 30 weight percent of conjugated diolefin containing polymer,

(c) adding the mixture from (b) to an agitated coagulation mixture maintained at a temperature of from about 50° to about 80° C., said coagulation mixture comprising one of a sodium chloride-sulphuric acid mixture maintained at a pH of from about 3 to about 4.5 or calcium chloride,

(d) separating, recovering and drying the so coagulated silica-polymer mixture.

4,482,658

PROCESS AND APPARATUS FOR PREPARING AQUEOUS DISPERSIONS OF SYNTHETIC RESINS

Friedrich Vock; Peter Lessmeister, and Ralf Kirchner, all of Münster, Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 304,008, Sep. 21, 1981, abandoned. This application Dec. 15, 1982, Ser. No. 449,986

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037575

Int. Cl.³ C08J *3/00*

U.S. Cl. 523—348 7 Claims

1. In a process for preparing aqueous dispersions of synthetic resins by: (a) precipitating the synthetic resins with water from their solutions in water-miscible solvents while simultaneously subjecting them to mechanical stresses using, milling means; (b) separating precipitated solids; and (c) simultaneously with step (b) distributing said precipitated solids in an aqueous medium; the improvement comprising:

carrying out step (a) in the presence of inert and moving milling means comprising glass milling balls.

4,482,659

TOUGHENED THERMOSETTING COMPOSITIONS FOR COMPOSITES

Zal N. Sanjana, Verona, and Joseph R. Marchetti, Greensburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,150
Int. Cl.³ C08G 59/42; H01B 3/40; B29D 3/02
U.S. Cl. 523—414 **18 Claims**

1. A water based B-stageable thermosetting epoxy composition which comprises:

(A) a water compatible epoxy resin;

(B) about 5 to about 35%, based on total solids, of a water-dispersed emulsion polymerized impact modifier which is a copolymer of butadiene and a monomer copolymerizable therewith in an emulsion polymerization process, said copolymer having a T_g of less than about −20° C.;

(C) about 1.5 to about 7%, based on the weight of said epoxy resin, of a water compatible epoxy hardener; and

(D) up to about 0.3%, based on the weight of said epoxy resin, of a catalyst; and

(E) sufficient water to produce a viscosity of about 100 to about 400 centipoises.

4,482,660

PREPREG FOR MAKING A COMPOSITE HAVING HIGH ELONGATION AND HEAT RESISTANCE AND PROCESS FOR MAKING SUCH COMPOSITE WITH THE PREPREG

Tsuyoshi Minamisawa, and Masato Andoh, both of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 458,004
Claims priority, application Japan, Jan. 14, 1982, 57-3341
Int. Cl.³ C08L 63/00
U.S. Cl. 523—428 **30 Claims**

1. A prepreg for making a composite having reinforcing fibers impregnated with a resin composition comprising (A) an epoxy resin wherein said epoxy resin of component (A) consists of 50 to 80 wt% based on the total epoxy resin of at least one glycidylamine epoxy resin selected from the group consisting N,N,N',N'-tetraglycidyldiaminodiphenylmethane, and N,N-diglycidylmethane aminophenol glycidyl ether, (B) a reaction product of an epoxy resin and a butadiene-acrylonitrile copolymer having carboxyl groups on at least both terminals of the molecular chain of the copolymer, and (C) 4,4'-diaminodiphenylsulfone as a curing agent and wherein component (B) is used in an amount of 3 to 25 parts by weight, per 100 parts by weight of the epoxy resin as component (A).

4,482,661

ALUMINIZED EPOXY-URETHANE COATING

Tony Y. Liu, East Windsor, N.J., assignor to The Valspar Corporation, Minneapolis, Minn.

Filed Jul. 14, 1983, Ser. No. 513,896
Int. Cl.³ C08K 3/08
U.S. Cl. 523—439 **4 Claims**

1. A two-component coating composition wherein:

Component A comprises (1) the reaction product of a digylcidyl ether of bisphenol A, having an epoxy equivalent weight between about 170 and about 2,000, a polyfunctional acid in an amount of from about 0.1–0.6 equivalent per 1.0 equivalent of epoxy resin and a mixture of a high base strength aliphatic amine and a low base strength aromatic amine, the amount of each amine reacted is from about 0.1–0.6 equivalent per 1.0 equivalent of epoxy resin, the weight ratio of aliphatic amine to aromatic amine is from about 2:1 and 1:2; (2) from about 3.0 to 12.0 wt. % of a cumarone-indene resin having a softening point between about 40° F. and 82° F.; (3) a thickening proportion of a thixotropic agent; (4) an extending proportion of a lamellar extender; and (5) from about 20.0 to 35.0 wt. % of a non-leafing aluminum paste; and

Component B comprises a urethane prepolymer based on a flexible polyhydroxy functional oligomer and a diisocyanate;

wherein said Components A and B are in a volume ratio of between about 1:3 and about 3:1 and mixed at the time of application.

4,482,662

WATER-SOLUBLE AEROSOL PAINT COMPOSITIONS

Stanley Rapaport, Shaker Heights, and Francis J. Cachat, Rocky River, both of Ohio, assignors to Plasti-Kote Company, Inc., Medina, Ohio

Continuation-in-part of Ser. No. 401,838, Jul. 26, 1982, Pat. No. 4,420,575. This application Dec. 12, 1983, Ser. No. 560,428
Int. Cl.³ C09D 3/66, 5/02
U.S. Cl. 523—504 **9 Claims**

1. A protective and decorative aerosol coating composition adapted for application from a pre-packaged pressurized spray container which comprises from about 15% to about 40% by weight of water as the principal solvent phase; from about 5% to less than 30% by weight of a water-soluble, volatile organic solvent selected from the group consisting of alcohols, ketones and/or esters and admixtures thereof, having less than six carbon atoms in their chemical structures, from about 20% to about 45% by weight of a liquified propellant under pressure, the major proportion of which is an oxygenated ether selected from the group consisting of methyl ethyl ether, dimethyl ether, propylene oxide 1-3 and propylene oxide 1-2; from about 5% to about 20% by weight of a non-volatile, substantially water-soluble, film-forming, monomer-modified organic polyester polymer whose normal acid value is greater than 30 and not more than about 80, which acid value is neutralized with a base selected from the group consisting of ammonia, amines, basic inorganic lithium compounds and admixtures thereof, and from 0 to about 15% by weight of a paint pigment dispersed in said aqueous solution above; said neutralized aqueous polymer solution being substantially free from insoluble polymer particulates greater than 0.1 microns in diameter.

4,482,663

RUBBER COMPOSITIONS COMPRISING A SILICEOUS FILLER IN COMBINATION WITH AN ORGANOSULFUR SUBSTITUTED PYRIDINE PROMOTOR

Gerard Kraus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 12, 1982, Ser. No. 397,399
Int. Cl.³ C08K 3/36
U.S. Cl. 524—99 **17 Claims**

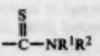
1. A silica-containing vulcanizable composition comprising:

(a) a vulcanizable natural or synthetic rubber;

(b) a siliceous filler; and

(c) at least one organosulfur-substituted pyridine compound of the formulas

wherein R is hydrogen or an alkyl group having from 1 to about 6, inclusive, carbon atoms per molecule and X is selected from $—SR^1$, $—R^3—SR^1$ and



wherein R^1 and R^2 correspond to R and R^3 is an alkylene radical having from 1 to 4 inclusive carbon atoms per molecule.

4,482,664

DISPERSIONS OF FINELY DIVIDED SYNTHETIC RESINS IN PLASTICIZERS

Rainer Blum, Ludwigshafen-Edigheim; August Lehner, Rödersheim, and Bernhard Rubbert, Münster, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,457

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138625

Int. Cl.³ C08K *5/21, 27/06*

U.S. Cl. 524—212 **12 Claims**

1. A dispersion of finely divided synthetic resins and plasticizers, comprising: finely divided synthetic resins selected from the group consisting of vinyl chloride polymers, acrylate polymers and mixtures of vinyl chloride polymers and acrylate polymers and 0.01 to 30% by weight, relative to the total weight of synthetic resin and plasticizers, of an isocyanate-free reaction product selected from the group consisting of

(a) a monoamine reacted with a monoisocyanate, a polyisocyanate or a mixture of a monoisocyanate and a polyisocyanate;

(b) a monoamine in combination with a polyamine compound reacted with a monoisocyanate, a polyisocyanate or a mixture of a monoisocyanate and a polyisocyanate;

(c) a polyamine compound reacted with a monoisocyanate; and

(d) a polyamine compound reacted with a mixture of monoisocyanate and polyisocyanate wherein said reaction product is produced by reaction in the presence of said plasticizers.

4,482,665

ENCAPSULATION OF ELECTRONIC COMPONENTS WITH CALCIUM SILICATE-CONTAINING POLY(ARYLENE SULFIDE) COMPOSITIONS

James S. Dix, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 14, 1982, Ser. No. 417,949

Int. Cl.³ C08K *5/54, 3/34*

U.S. Cl. 524—262 **21 Claims**

1. An article of manufacture comprising an electronic component encapsulated with a composition; wherein said composition comprises:

(i) about 25 to about 45 weight percent poly(arylene sulfide),

(ii) about 5 to about 30 weight percent calcium silicate,

(iii) about 40 to about 60 weight percent filler, and

(iv) about 0 to about 4 weight percent organosilane;

wherein said weight percentages are based upon total amount of (i), (ii), (iii) and (iv).

4,482,666

EMULSIONS OF LIQUID HYDROCARBONS WITH WATER AND/OR ALCOHOLS

Russell R. Reeves, Richmond, Australia, assignor to Apace Research Limited, Richmond, Australia

Filed Mar. 2, 1983, Ser. No. 471,536

Claims priority, application Australia, Mar. 12, 1982, 3086/82; Nov. 30, 1982, 7052/82

Int. Cl.³ C08K *5/05*

U.S. Cl. 524—389 **40 Claims**

1. An emulsion having in one phase a hydrocarbon liquid and in the other phase water and/or an alcohol, characterised in that the emulsion contains an emulsifier comprising a block copolymer containing at least one polymeric block of at least one monomer selected from the group comprising styrene and ring substituted styrenes and at least one polymeric block of at least one monomer selected from the group having the formula:

$$H(O—R)_nOH$$

wherein

R is an aliphatic hydrocarbon radical containing from 1 to 4 carbon atoms, and

n is a number between 4 and 4000.

4,482,667

MODIFIED POLYALKYLENEPOLYAMINES

Stephen B. Willis, Lake Jackson, and Pamela J. Boyce, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 548,475, Nov. 3, 1983,. This application Mar. 5, 1984, Ser. No. 586,374

Int. Cl.³ C08G *59/00*

U.S. Cl. 523—400 **4 Claims**

1. A modified alkylenediamine or polyalkylenepolyamine composition comprising the product resulting from reacting

(A) at least one composition prepared by reacting

(1) a alkylenediamine or polyalkylenepolyamine composition having an average molecular weight of from about 60 to about 500 with

(2) at least one alkylene dihalide with

(B) at least one of

(1) an epihalohydrin or dihalohydrin,

(2) an adduct of

(a) an epihalohydrin or dihalohydrin and

(b) an alkylenediamine, polyalkylenepolyamine having an average molecular weight of from about 60 to about 500 or mixture thereof or

(3) mixture thereof; and wherein

(C) component (A-1) and component (A-2) are reacted in quantities such that the quantity of A-2 used is less than the amount needed to form a gel by an amount (expressed as weight of carbon and hydrogen contained in A-2) of from about 0.8% to about 5% of the weight of carbon plus hydrogen plus nitrogen present in the reaction mixture when a gel would be formed;

(D) components (A) and (B) are employed in quantities which provide a polyamine which gives a fluid loss of less than 60 ml, according to the API RP 10B fluid loss test described in the examples.

4,482,668

POLY(ARYLENE SULFIDE) CONTAINING TALC

John E. Leland, and Paul J. Boeke, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 15, 1982, Ser. No. 434,663

Int. Cl.³ C08K *3/34, 3/10*

U.S. Cl. 524—413 **30 Claims**

1. A composition comprising poly(arylene sulfide) and talc; wherein said talc has a median particle size not exceeding about 4 microns; and wherein the amount of talc in the composition is about 40 to about 140 parts by weight per 100 parts by weight of poly(arylene sulfide).

4,482,669

PRECERAMIC ORGANOSILAZANE POLYMERS

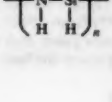
Dietmar Seyferth, Lexington, and Gary H. Wiseman, Somerville, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 19, 1984, Ser. No. 572,209

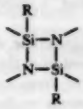
Int. Cl.³ C08K *3/34*

U.S. Cl. 524—442 **33 Claims**

1. A polysilazane comprising: a plurality of precursor residues having repeating units of the formula:



said residues being linked together by Si_2N_2 bridges having the formula



wherein:

R is hydrogen, a lower alkyl group having from 1 to about 6 carbon atoms, a lower alkoxy group having from 1 to about 6 carbon atoms, a substituted or unstubstituted vinyl group, a substituted or unsubstituted allyl group, a substituted or unsubstituted lower aryl group having from 6 to about 10 carbon atoms, a tri(lower)alkyl- or di(lower)alkylsilyl group or a di(lower)alkylamino group; and

n is an integer greater than 1;

said residue being cyclic or linear.

30. The polysilazane of claim 1 in admixture with a ceramic powder or a ceramic fiber.

4,482,670

METHOD OF POLYMERIZING POLYDIORGANOSILOXANE FLUID-FILLER MIXTURE USING SULFURIC OR SULFONIC ACIDS

John C. Saam, Midland, and James R. Falender, Sanford, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 14, 1983, Ser. No. 474,918
Int. Cl.³ C08L *83/04*
U.S. Cl. 524—860 **21 Claims**

1. A method of producing a non-crepeing silicone polymer-filler mixture by bulk polymerization comprising

(A) mixing

(i) 100 parts by weight of polydiorganosiloxane (a) of the formula

$$HO(R_2SiO)_xH,$$

wherein each R is a radical selected from the group consisting of methyl, ethyl, propyl, phenyl, vinyl, allyl, and 3,3,3-trifluoropropyl, and x is an average value in the range of from 3 to 100 inclusive; optionally (i) can have present siloxane selected from the group consisting of polydiorganosiloxane (c) of the formula

$$R_3'SiO(R_2SiO)_zSiR_3',$$

polydiorganosiloxane (d) of the formula

$$R_3'SiO(R_2SiO)_zH,$$

and mixtures thereof wherein each R is as defined above, each R' is a monovalent hydrocarbon radical of 6 or less carbon atoms, and z is an average value in the range of from 0 to 50 inclusive;

(ii) from 2 to 70 parts by weight of reinforcing filler, said filler being acidic or neutral; and

(iii) a catalytic amount of sulfuric acid or a sulfonic acid of the formula XSO_3H, wherein X is selected from the group consisting of halogen, alkyl, aryl, alkoxy, and alkaryl radicals,

(B) allowing polymerization to take place, and

(C) inactivating the catalyst with a Lewis base to produce a non-crepeing dispersion of reinforcing filler in a polydiorganosiloxane having a higher molecular weight than the starting material in (i).

4,482,671

BASE FOR A GRAFT POLYMER, NOVEL GRAFT POLYMER COMPOSITIONS, SOLVENT AND WATER-REDUCIBLE COATINGS INCORPORATING THE NOVEL GRAFT POLYMERS, AND PROCESSES FOR MAKING THEM

James T. K. Woo, Medina, Ohio; Vincent W. Ting, Boulder, Colo., and Richard M. Marcinko, North Royalton, Ohio, assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 132,507, Mar. 21, 1980, Pat. No. 4,399,241. This application Nov. 1, 1982, Ser. No. 438,375
Int. Cl.³ C08L *63/02, 67/00*
U.S. Cl. 525—31 **11 Claims**

1. A process comprising reacting:

(a) a tractable grafting base comprising:

(i) a 1,2-epoxy resin having an epoxy equivalent weight of at least 500 and

(ii) a second, extender polymer selected from polystyrene, low molecular weight polyethylene, styrene-acrylate copolymer, ethylene-vinyl acetate copolymer, a hydroxyl terminated polyester or polyurethane, styrene-acrylonitrile copolymer, a hydrocarbon resin, a second epoxy resin, or a mixture thereof;

said 1,2 epoxy resin and said extender polymer having aliphatic backbone carbon atoms including carbons having only one or two hydrogens bonded thereto, each of said 1,2 epoxy resin and said extender polymer contributing at least 10% by weight of the total solids present, and

(b) vinyl monomer that is addition polymerizable through its ethylenic unsaturation selected from ethylenically acrylic or methacrylic acid, styrene, ethylenically unsaturated acid esters, or mixtures thereof; and

in the presence of a free radical initiator that is characterized by its ability to abstract hydrogen, at a temperature and in sufficient quantity that said initiator is operative simultaneously to cause addition polymerization of the monomer and to cause graft polymerization by carbon-to-carbon bonds of addition polymer to at least some of said aliphatic backbone carbons that have one or two hydrogens bonded thereto in the ungrafted state.

4,482,672

THERMOPLASTIC MOULDING COMPOSITIONS OF POLYCARBONATE, POLYALKYLENE TEREPHTHALATE, GRAFT COPOLYMER AND POLYETHYLENE

Dieter Neuray, New Martinsville, W. Va.; Werner Nouvertné; Rudolf Binsack, both of Krefeld, Fed. Rep. of Germany; Dieter Rempel, and Peter R. Müller, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 373,987, May 3, 1982, abandoned. This application Apr. 22, 1983, Ser. No. 487,501
Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118526
Int. Cl.³ C08L *67/02, 69/00*
U.S. Cl. 525—67 **5 Claims**

1. Thermoplastic moulding compositions comprising

(A) from 1 to 99 parts, by weight, of polyalkylene terephthalate;

(B) from 1 to 99 parts, by weight, of an aromatic polycarbonate free from o,o,o',o'-tetramethylbisphenol residues; and

(C) from 1 to 30 parts, by weight, of a graft copolymer having a glass transition temperature below −20° C., which graft copolymer (C) is selected from:

(1) graft copolymers obtainable by grafting

(I) from 10 to 40%, by weight, based on (1), of at least one (meth)acrylic acid ester and/or of a mixture of from 10 to 35%, by weight, based on the mixture, of acrylonitrile and from 65 to 90%, by weight, based on the mixture, of styrene on

(II) from 60 to 90%, by weight, based on (1), of a butadiene polymer containing at least 70%, by weight,

based on (II), of butadiene residues as the graft base, the gel content of the graft base (II) amounting to ≧70% (as measured in toluene), the degree of grafting, G, to from 0.15 to 0.55 and the average particle diameter, d_{50}, of the graft copolymer (B) to from 0.2 to 0.6 μm;

(2) graft copolymers of

(a) from 80 to 98%, by weight, based on (2), of an acrylate rubber having a glass transition temperature below −20° C. as the graft base and

(b) from 2 to 20%, by weight, based on (2), of at least one polymerizable ethylenically unsaturated monomer, of which the homo- or co-polymer formed in the absence of (a) would have a glass transition temperature above 25° C., as the graft monomer the monomer (b) having been grafted onto the completely broken latex, suspended in water, of (a) in the absence of suspending agents;

the quantities of components (A), (B) and (C) totalling 100 parts, by weight, characterized in that the compositions additionally contain (D) a softening temperature increasing amount of from 0.5 to 4 parts by weight per 100 parts by weight of (A+B+C) of at least one ethylene/acrylic acid copolymer containing from 1 to 8% by weight of acrylic acid units based on the copolymer weight.

4,482,673

AQUEOUS COATING COMPOSITION COMPRISING SELF-EMULSIFIABLE ESTER OF EPOXY AND ACID CONTAINING ADDITION POLYMER AND METHOD OF ITS PREPARATION

George L. Brown, Scotch Plains; Miksa de Sorgo, Freehold, and Arthur T. Spencer, New Providence, all of N.J., assignors to SCM Corporation, New York, N.Y.

Continuation of Ser. No. 249,784, Apr. 1, 1981, abandoned, which is a continuation of Ser. No. 95,738, Nov. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 914,471, Jun. 12, 1978, abandoned. This application May 14, 1982, Ser. No. 378,314

Int. Cl.³ C08G *59/00*

U.S. Cl. 525—119 **1 Claim**

1. A method of esterifying a solvent-soluble carboxyl-functional polymer with an epoxy resin without gelation which comprises conducting the esterification reaction in organic solvent medium in the presence of greater than about 1.5% based on the weight of the reactants subjected to esterification, of an amine esterification catalyst and at an elevated temperature sufficient to cause the oxirane groups of said epoxy resin to react with said carboxyl groups until said oxirane groups are substantially entirely consumed; in which said epoxy resin comprises aromatic polyethers containing oxirane groups, at least 5% of said aromatic polyethers being diepoxide, said epoxy resin constituting at least about 40% of the total resin solids content and containing sufficient oxirane groups to provide a ratio of oxirane groups to carboxyl groups of from 1:2 to 1:20 to produce an epoxy resin-carboxyl polymer ester, the improvement comprising:

dispersing said epoxy resin-carboxyl polymer ester in an organic medium of organic solvent.

4,482,674

WATER-DILUTABLE BINDER, A PROCESS FOR ITS PREPARATION AND ITS USE

Christoph Just, Niedernhausen; Jürgen Ritz, Mainz, and Rolf Zimmermann, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,671

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149828

Int. Cl.³ C08L *7/00, 9/00, 15/00, 75/00*

U.S. Cl. 525—124 **10 Claims**

1. A water-dilutable binder for coatings based on reaction products of diene polymers and poly-unsaturated polyfunctional amidoamines, which comprises

(a) a cyclorubber selected from the group consisting of cyclized natural rubber, cyclized polyisoprene and cyclized polybutadiene

(b) a polyfunctional amidoamine which has been added to component (a) and is derived from the reaction of a monomeric unsaturated fatty acid free from conjugated double bonds having 12 to 18 carbon atoms or the oligomers of said fatty acid, with a polyalkylene polyamine selected from the group consisting of aliphatic polyamines having 2 to 12 carbon atoms and aromatic amines, said polyamidoamine containing primary, secondary and tertiary amine groups singly or mixed and

(c) a partially blocked polyisocyanate which has at least one free isocyanate group in the molecule and whose isocyanate groups which are not blocked are bonded to component (b).

6. A process for preparing a binder as claimed in claim 1, wherein the cyclorubber (a) is first reacted with (b) the polyfunctional amidoamine at a temperature of from 140°–300° C. in the melt or under concomitant use of an inert solvent, whereupon the reaction product thus obtained is further reacted at a temperature of from 0° to 120° C. with a partially blocked polyisocyanate, which is advantageously blocked only to such an extent that at least one free isocyanate group is still contained in the molecule.

10. Paints and coatings for electrocoating suitable for cataphoretic deposition obtained with the binder as claimed in claim 1 together with organic or inorganic acids or both, pigments, fillers, surface-active agents or other customary additives.

4,482,675

WATER-SOLUBLE, PRESSURE-SENSITIVE ADHESIVE COMPOSITION, AND PROCESS FOR MAKING SAME

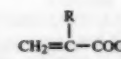
Edward Witt, Framingham, Mass., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,025

Int. Cl.³ C08F *20/06, 20/16*

U.S. Cl. 525—132 **16 Claims**

1. A water soluble, pressure-sensitive adhesive composition comprising the at least about 50% alkali metal neutralized, reaction product of a C_6–C_{18} alkyl phenol or C_6–C_{18} alkanol containg about 4 to 30 moles combined ethylene oxide with a copolymer of a monomer composition comprising by weight: from about 35 to 85% of acrylate monomer of the formula



wherein R is hydrogen or lower alkyl of 1 to 4 carbons, and R_1 is alkyl of 1 to 14 carbons, providing that at least 60% of R is C_4 or greater when R is hydrogen and at least 60% of R_1 is C_6 or greater when R is C_1 to C_4 from about 8 to 30% of an α,β-ethylenically unsaturated carboxylic acid anhydride and from about 8 to 30% of an auxiliary monomer selected from vinyl esters, vinyl ethers, vinyl halides, styrene, lower alkyl styrenes, lower alkyl methacrylates and α-olefins, the weight ratio of acrylate to anhydride being from about 1.5:1 to 8:1, the amount of said alkyl phenol or alkanol being sufficient to provide an alkyl phenol or alkanol:anhydride mole ratio of about 0.3 to 0.8, and at least about 0.7 when said acrylate:anhydride weight ratio is below about 4.

4,482,676

PRODUCTION OF SULFUR-MODIFIED SOLID CHLOROPRENE RUBBERS

Rüdiger Musch, Bergisch-Gladbach; Wilhelm Göbel, Leverkusen; Eberhard Müller, Dormagen, and Wolfgang Konter, Neuss, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,697

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210285

Int. Cl.³ C08L *11/02*

U.S. Cl. 525—215 6 Claims

1. A process for the production of sulfur-modified, vulcanisable solid chloroprene rubbers having viscosities of from 68 to 35 ME and sulfur contents of from about 0.3 to 0.45% by weight, characterised in that chloroprene is polyermised in the presence of from 0.05 to 0.40% by weight of sulfur to form a latex I, chloroprene is polymerised in the presence of from 0.5 to 1.5% by weight of sulfur to form a latex II, latices I and II are mixed, in a ratio of from 4:1 to 1:4 (based in each case on solids) and the mixture is peptised and worked up to form the solid rubber, the percentages quoted being based on the quantity of monomer.

4,482,677

PROCESS FOR PRODUCING HIGH IMPACT POLYSTYRENE

Osamu Teranaka; Tsutomu Kakutani; Haruro Tabata, and Tutomu Teraoka, all of Oita, Japan, assignors to Japan Elastomer Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,338

Claims priority, application Japan, Aug. 25, 1980, 55-115845

Int. Cl.³ C08F *279/02*

U.S. Cl. 525—250 17 Claims

1. A process for producing a high impact polystyrene, characterized by polymerizing a conjugated diene by the use of an organolithium-based catalyst containing a polyfunctional organolithium compound, then coupling the resulting polymer molecules with a polyfunctional treating agent having at least two reactive sites capable of reacting with the active lithium terminal of the polymer, the amount of said polyfunctional treating agent being 0.1–2 equivalents based on the lithium in the lithium-terminated polymer obtained by polymerizing said conjugated diene with said organolithium-based catalyst, dissolving in styrene the conjugated diene polymer thus obtained having substantially a network structure and substantially soluble in styrene, and radical-polymerizing the resulting solution by bulk polymerization or bulk-suspension polymerization.

4,482,678

DIENE RUBBER COMPOSITION AND TIRE USING IT IN TREAD

Hiroshi Furukawa, Ashiya; Yuichi Saito, Nishinomiya; Akio Imai, Ichihara; Nobuyuki Yoshida, Ichihara, and Yasushi Okamoto, Ichihara, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe and Sumitomo Chemical Company, Limited, Osaka, both of, Japan

Filed Aug. 23, 1983, Ser. No. 525,698

Claims priority, application Japan, Aug. 23, 1982, 57-146459

Int. Cl.³ C08L *7/00, 9/00, 9/06*

U.S. Cl. 525—236 6 Claims

1. A diene rubber composition comprising an elastomeric polymer as a main rubber component and rubber additives, said elastomeric polymer being an elastomeric homopolymer of butadiene or copolymer of butadiene and an aromatic vinyl compound prepared by a solution polymerization method and having a glass transition temperature of not less than −50° C. and an intrinsic viscosity of 1.7 to 2.5 dl./g. at 30° C. in toluene, and not less than 40% by weight to less than 65% by weight of the polymer chains of said elastomeric polymer being those modified with a trifunctional or tetrafunctional coupling agent selected from the group consisting of trichloromethylsilane, silicon tetrachloride, tin tetrachloride, titanium tetrachloride, tetrabromobenzene, trichlorobenzene, dimethyl adipate, diethyl adipate, dioctyl adipate, diethyl furmarate, dimethyl maleate and dioctyl maleate.

6. A tire whose tread is made from a rubber composition comprising an elastomeric polymer and rubber additives, said elastomeric polymer being an elastomeric homopolymer of butadiene or copolymer of butadiene and an aromatic vinyl compound prepared by a solution polymerization method and having a glass transition temperature of not less than −50° C. and an intrinsic viscosity of 1.7 to 2.5 dl./g. at 30° C. in toluene, and not less than 40% by weight to less than 65% by weight of the polymer chains of said elastomeric polymer being those modified with a trifunctional or tetrafunctional coupling agent selected from the group consisting of trichloromethylsilane, silicon tetrachloride, tin tetrachloride, titanium tetrachloride, tetrabromobenzene, trichlorobenzene, dimethyl adipate, diethyl adipate, dimethyl maleate, dioctyl maleate, dioctyl adipate and diethyl fumarate.

4,482,679

HEAT-CURABLE EPOXY COMPOSITIONS CONTAINING DIARYLIODOSYL SALTS

Edward Irving, Burwell, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,803

Claims priority, application United Kingdom, Sep. 18, 1982, 8226705

Int. Cl.³ C08G *59/68, 59/70*

U.S. Cl. 525—327.3 19 Claims

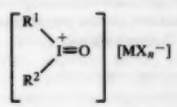
1. A heat-curable composition comprising

(A) an epoxide resin and

(B) an effective amount of

(i) a diaryliodosyl salt of formula

I



where

R^1 and R^2, which may be the same or different, each represent a monovalent aromatic radical of from 4 to 25 carbon atoms,

M represents a metal or metalloid atom,

X represents a halogen atom, and

n is 4, 5, or 6, and is greater by one than the valency of M or MX_n^- represents pentafluorohydroxoantimonate, and

(ii) as catalyst for the diaryliodosyl salt, a salt or complex of a d-block transition metal, a stannous salt, an organic peroxide, or an activated α-hydroxy compound.

4,482,680

QUATERNARY AMMONIUM GROUP-CONTAINING POLYMERS HAVING ANTIMICROBIAL ACTIVITY

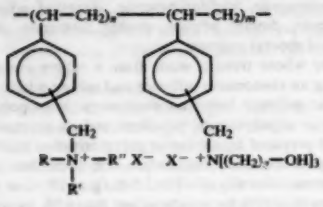
Bernard G. Sheldon, Palo Alto; Robert E. Wingard, Jr., Mountain View; Ned M. Weinshenker, Palo Alto, and Daniel J. Dawson, Los Altos, all of Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation of Ser. No. 302,684, Sep. 15, 1981, abandoned. This application Apr. 13, 1983, Ser. No. 484,721

Int. Cl.³ C08F *114/02;* A01N *33/12;* C08F *214/02*

U.S. Cl. 525—331.4 9 Claims

1. A compound having the structural formula:



wherein R is a 4 to 12 carbon atom alkyl and R' and R'' independently are 1 to 4 carbon atom alkyls, X^- is a physiologically acceptable anion, q is an integer from 2 to 4 and n and m are integers, the sum of which is from 20 to 10,000 with m being from 0.2 to 0.9 times the sum of m plus n.

4,482,681

CROSSLINKING HALOGEN-CONTAINING POLYMERS

Dominic A. Berta, and Vernon L. Kyllingstad, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Sep. 29, 1982, Ser. No. 427,329

Claims priority, application United Kingdom, Oct. 22, 1981, 8131937

Int. Cl.³ C08F *8/34*; C08G *65/32*

U.S. Cl. 525—349 **2 Claims**

1. The process of crosslinking a halogen-containing polymer which comprises heating said polymer in the presence of a basic material; a crosslinking agent chosen from the group consisting of 2,5-dimercapto-1,3,4-thiadiazole, monobenzoate derivatives of 2,5-dimercapto-1,3,4-thiadiazole; trithiocyanuric acid; 2,4-dithiohydantoins; and dibenzoate derivatives of 2,5-dimercapto-1,3,4-thiadiazole; and a hydrated salt chosen from the group comprising magnesium sulfate heptahydrate, sodium sulfite heptahydrate, sodium citrate pentahydrate and potassium aluminum sulfate dodecahydrate.

4,482,682

PROCESS FOR PREPARING WATER-SOLUBLE, PARTIALLY-HYDROLYZED, SOLID ACRYLAMIDE POLYMER

Hiroyuki Kudomi, and Shinichi Sato, both of Kitakyusyu, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Mar. 23, 1983, Ser. No. 477,956

Int. Cl.³ C08F *8/12*

U.S. Cl. 525—369 **6 Claims**

1. A process for preparing solid, water-soluble, partially hydrolyzed acrylamide polymer which comprises the following steps,

(A) polymerizing an aqueous monomer solution containing acrylamide or mixture of acrylamide and other copolymerizable monomers, in the presence of polymerization initiator to obtain a hydrous gel of water-soluble acrylamide polymer,

(B) dividing the thus obtained hydrous gel into grains,

(C) bringing the grains into contact with an aqueous caustic alkali solution,

(D) maintaining the thus obtained polymer grains at a temperature of from 50° to 150° C. to hydrolyze the amido groups in the polymer for a time sufficient to achieve 60% or more of the desired degree of hydrolysis while maintaining the reduction in the water content of the polymer at 10% or less, and

(E) drying the thus obtained polymer grains with hot air.

4,482,683

STABILIZED SULFUR-CONTAINING RESINS, SUCH AS POLYPHENYLENE SULFIDE AND METHOD OF PRODUCING THE SAME

Ferdinand Quella, Gauting, and Hans-Friedrich Schmidt, Eurasburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 388,179, Jun. 14, 1982, Pat. No. 4,447,581. This application Dec. 1, 1983, Ser. No. 556,984

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127355; Mar. 16, 1982, 3209525

Int. Cl.³ C08G *75/16, 75/20*; C08L *81/34*

U.S. Cl. 525—537 **5 Claims**

1. A method of reducing sulfur-containing exhaust gases from polyphenylene sulfide comprising:

adding an effective amount of an additive material selected from the group consisting of condensable polymerizable aromatic ketones, condensable polymerizable aromatic amines, condensable polymerizable aromatic amides, and condensable polymerizable aromatic imides in the form of reactive monomers to base materials forming polyphenylene sulfide during the manufacturing process of polyphenylene sulfide, said effective amount being in the range of about 0.1% to about 5% by weight, based on the weight of said polyphenylene sulfide; and

subsequently incorporating said additive material into the polymer chain of polyphenylene sulfide as a copolymer, whereby at least some sulfur-containing exhaust gases given off from said polyphenylene sulfide are absorbed by said additive material.

5. A sulfur-stabilized resin material comprised of a sulfur-containing polymer having an effective amount of an additive material selected from the group consisting of condensable polymerizable aromatic ketones, condensable polymerizable aromatic amines, condensable polymerizable aromatic amides, and condensable polymerizable aromatic imides incorporated into the polymer chain of said sulfur-containing polymer, said effective amount being in the range of about 0.1% to about 5% by weight, based on the weight of said sulfur-containing polymer, whereby at least some sulfur-containing exhaust gases given off from said sulfur-containing polymer are absorbed by said additive material.

4,482,684

PROCESS FOR POLYMERIZATION OF VINYL MONOMERS WITH IMPROVED KINETIC RATE PROFILE

Keith L. Gardner, and Richard A. Jones, both of Avon, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 258,978, Apr. 30, 1981, abandoned. This application Sep. 28, 1982, Ser. No. 426,048

Int. Cl.³ C08F *2/38, 2/20*

U.S. Cl. 526—84 **4 Claims**

1. In the process of aqueous suspension homopolymerization and copolymerization of vinyl monomer(s) in the presence of a polymerization initiator and a dispersant and at a temperature in the range of about 0° C. to about 100° C., the improvement which comprises adding to the aqueous suspension of vinyl monomer(s) during the polymerization thereof from about 0.001 part to about 0.01 part by weight, based on the weight of the monomer(s), of a polymerization inhibitor selected from the group consisting of 2,2'-methylene bis (4,6-di-tertiary butylphenol and 2,2'-ethylidene bis (4,6-di-tertiary butylphenol).

4,482,685
COPOLYMERIZATION OF ETHYLENE AND CHLOROTRIFLUOROETHYLENE IN AN AQUEOUS EMULSION

Hong B. Chin, Parsippany, and Swayambu Chandrasekaran, Mountain Lakes, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 30, 1982, Ser. No. 429,916
Int. Cl.³ C08F *210/02*
U.S. Cl. 526—91 **23 Claims**

1. A method of copolymerizing ethylene and chlorotrifluoroethylene to form a copolymer having from 30 to 65 mol percent ethylene in an aqueous emulsion comprising the step of copolymerizing ethylene and chlorotrifluoroethylene in the presence of water, a water soluble initiator and from 0.1 to 5.0 percent by weight of water of a water soluble fluorosurfactant having the formula: $CA_3(CF_2)_B(C_2H_4)_D$-X wherein A is selected from the group consisting of H and F, B is 1 to 10, D is 1 to 6, and X is a hydrophilic group, wherein to be water soluble at least 0.1 percent by weight of the fluorosurfactant must dissolve in water.

4,482,686
CATALYST AND PROCESS FOR STEREOSPECIFIC POLYMERIZATION OF α-OLEFINS

Satoshi Asahi, Sodegaura; Shigeo Mori, Ichihara, and Yasuhiro Takeshita, Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 264,800, May 18, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 538,352
Claims priority, application Japan, May 23, 1980, 55-67857
Int. Cl.³ C08F *4/02, 10/06*
U.S. Cl. 526—119 **17 Claims**

1. A process for the stereospecific polymerization of propylene which comprises polymerizing propylene with a catalyst comprising (A) the reaction product of a magnesium compound and a titanium compound and (B) an organoaluminum compound, wherein Component (A) is prepared by the method consisting essentially of the following two steps:

(a) (i) a magnesium compound of the formula

$$Mg(OR^1)_2$$

wherein R^1 is an alkyl group having from 1 to 4 carbon atoms, (ii) at least one halogen-containing compound selected from the group consisting of trichloroacetonitrile, n-butyl chloride, monochlorobenzene, allyl chloride, epichlorohydrin, carbon tetrachloride, and methyl iodide, and (iii) an oxygen-containing titanium compound of the formula

$$Ti(OR^2)_4$$

wherein R^2 is an alkyl group having from 1 to 6 carbon atoms, are reacted with each other at the same time in the presence or in the absence of an aromatic carboxylic acid ester to produce a solid reaction product; and

(b) said solid reaction product formed in Step (a) is, as it is or after a pre-treatment with an aromatic carboxylic acid ester, reacted with at least one halogen-containing tetravaent titanium compound selected from $TiCl_4$, $TiBr_4$, CH_3OTiCl_3 and $(C_2H_5O)_2TiCl_2$ in the presence or in the absence of said aromatic carboxylic acid ester, and always in the presence of said aromatic carboxylic acid ester when said aromatic carboxylic acid ester was not used in at least one of the preceding steps.

4,482,687
PREPARATION OF LOW-DENSITY ETHYLENE COPOLYMERS IN FLUID BED REACTOR

Allen Noshay, East Brunswick; Frederick J. Karol, Belle Mead, both of N.J., and Robert J. Jorgensen, Dunbar, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 85,313, Oct. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 962,112, Nov. 20, 1978, abandoned. This application Jun. 24, 1983, Ser. No. 506,772
Int. Cl.³ C08F *2/34, 10/02*
U.S. Cl. 526—125 **14 Claims**

1. A continuous catalytic process for producing ethylene copolymer containing ≧90 mol percent of ethylene and ≦10 mol percent of one or more C_3 to C_8 α olefins with a Ti containing catalyst at a productivity of ≧500,000 pounds of polymer per pound of Ti under a pressure of <1000 psi in a gas phase fluid bed reaction, said polymer being produced in granular form and having a density of about 0.91 to 0.94 and a melt flow ratio of ≧26 to ≦40, which comprises copolymerizing ethylene with one or more C_3 to C_8 α olefin monomers at a temperature of about 30° to 105° C. by contacting a monomer charge containing said C_3 to C_8 α olefin monomers and ethylene in a mol ratio no greater than 0.6, in a gas phase reaction zone, with particles of a catalyst system comprising an activated copulverized composition, wherein said composition has the following empirical composition

$$Mg_mTi(OR)_nX_p[ED]_q$$

wherein
m is ≧5 to ≦200
n is 0 or 1
p is ≧10 to ≦400
q is >0 to 3.0
R is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical, or COR′ wherein R′ is a C_1 to C_{14} aliphatic or hydrocarbon radical,
X is Cl, Br, I or mixtures thereof, and
ED is a liquid organic electron donor compound selected from the group consisting of alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers, aliphatic ketones and di- or polyamino compounds, said composition prepared by copulverizing magnesium dihalide with a complex obtained by contacting a titanium compound of the formula

$$Ti(OR)_aX_b$$

wherein R and X are as previously defined and a is 0 or 1, b is 2 to 4 inclusive and a+b=3 or 4, with an electron donor compound ED, as previously defined, said copulverized composition being either partially activated with >0 to ≦10 mols of activator compound per mol of titanium compound in said copulverized composition prior to feeding of the activated copulverized composition to said reaction zone and then being completely activated in said reaction zone with ≧10 to 400 mols of activator compound per mol of titanium compound in said copulverized composition, or completely activated in said reaction zone with ≧10 to 400 mols of activator compound per mol of titanium compound in said copulverized composition, said activator compound having the formula

$$Al(R'')_cX''_dH_e$$

wherein
X′ is Cl or OR‴, R″ and R‴ are the same or different and are C_1 to C_{14} saturated hydrocarbon radicals,
d is 0 to 1.5
e is 0 or 1

c+d+e=3.

4,482,688

LIGHT-COLORED HYDROCARBON AND TERPENE RESINS DECOLORIZED BY IODINE COMPOUNDS

Robert W. Schluenz, Panama City, Fla., assignor to Arizona Chemical Company, Fair Lawn, N.J.

Filed Jun. 1, 1982, Ser. No. 383,438
Int. Cl.³ C08F 36/00, 6/00
U.S. Cl. 526—237 5 Claims

1. A method of decolorizing resins of polymerized monomers consisting of C_5–C_{10} hydrocarbons having one or two ethylenic double bonds which comprises adding a decolorizing agent selected from iodine, and its compounds during or after polymerization, the amount of decolorizing agent being sufficient to decolorize the resin at elevated temperature in the range from about 130° to 240° C. or with ultraviolet radiation to Gardner Color of 1 or less.

4,482,689

PROCESS FOR THE PREPARATION OF POLYMETALLO(DISILYL)SILAZANE POLYMERS AND THE POLYMERS THEREFROM

Loren A. Haluska, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 12, 1984, Ser. No. 588,581
Int. Cl.³ C08G 77/04
U.S. Cl. 528—25 68 Claims

1. A process for preparing an $R_3'SiNH$-containing metallosilazane polymer, which process consists of contacting and reacting in an inert, essentially anhydrous atmosphere, a chlorine-containing disilane or a mixture of chlorine-containing disilanes of a general formula

$$(Cl_aR_bSi)_2,$$

a disilazane having the general formula

$$(R_3'Si)_2NH,$$

and a metal halide at a temperature in the range of 25° C. to 300° C. while distilling byproduced volatile products, wherein

R is a vinyl radical, an alkyl radical containing 1–3 carbon atoms, or a phenyl radical;

R' is a vinyl radical, a hydrogen radical, an alkyl radical containing 1–3 carbon atoms, or a phenyl radical;

a has a value of 0.5–3;

b has a value of 0–2.5;

the sum of (a+b) is equal to three;

the metal atom of said halide is selected from the group consisting of boron, phosphorous, and titanium;

said metal halide is a liquid at the reaction temperature; and

the boiling point of said metal halide is less than 300° C.

4,482,690

PROCESS FOR THE PRODUCTION OF POLYURETHANE UREA ELASTOMERS

Gus G. Orphanides, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 9, 1984, Ser. No. 578,735
Int. Cl.³ C08G 18/38
U.S. Cl. 528—64 5 Claims

1. In a process for the production of polyurethane urea elastomers comprising reacting:

(a) organic polyisocyanate;

(b) organic compounds having molecular weights of from 400–10,000 and containing at least two Zerewitenoff active hydrogen atoms; and

(c) an aromatic diamine as a chain extending agent; the improvement wherein at least a portion of the aromatic diamine used as a chain extender is t-butylbenzenediamine.

4,482,691

AIR-DRYING FATTY ACID-MODIFIED ACRYLIC RESINS

John B. Saunders, Jr., Allison Park; Karl F. Schimmel, Verona, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 22, 1983, Ser. No. 535,006
Int. Cl.³ C09D 3/58, 3/80, 3/72, 3/74
U.S. Cl. 528—69 15 Claims

1. An air-drying fatty acid-modified vinyl polymerized resin comprising moieties derived from:

(i) a copolymerizable monomer containing an epoxy group,

(ii) an air-drying fatty acid which esterifies through the epoxy group to form hydroxyl group(s),

(iii) an isocyanate consisting essentially of a monoisocyanate which reacts, partially, with the formed hydroxyl group(s), and

(iv) another copolymerizable monomer which is different from (i).

4,482,692

EPOXY RESIN COMPOSITIONS

James L. Bertram; William Davis, both of Lake Jackson, and Louis L. Walker, Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1983, Ser. No. 544,671
Int. Cl.³ C08G 59/02
U.S. Cl. 528—93 20 Claims

1. An epoxy resin composition prepared by reacting

(A) a reaction product of

(1) a cyanuric halide with

(2) at least one di- and/or polyhydric aromatic compound in a quantity which provides at least about 6 phenolic hydroxyl groups per mole of component A-1; with

(B) at least one dihydric or polyhydric phenol and

(C) at least one epoxy resin having an average of more than one vicinal epoxy group per molecule wherein components A, B and C are present in quantities which provide an epoxy to phenolic hydroxyl ratio of from about 2.25:1 to about 10:1 and wherein component (B) can be added as a separate component and/or it can be incorporated into the composition as unreacted component A-2.

5. A curable composition comprising a mixture of (1) a composition of claim 1 and (2) a curing quantity of a suitable curing agent and/or catalyst.

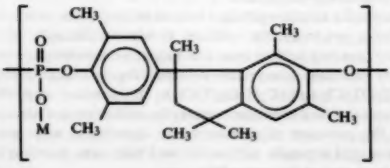
4,482,693

POLYPHOSPHATES AND THE PRODUCTION THEREOF

Volker Serini; Paul J. Mayska, both of Krefeld; Hans-Dieter Block, Cologne, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,156
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233615
Int. Cl.³ C08G 79/04
U.S. Cl. 528—167 3 Claims

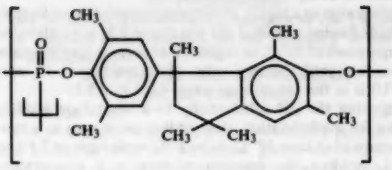
1. Polyphosphates, characterised in that they contain from 0.5 to 100 mol % of phosphate units corresponding to formulae (I) and/or (II):



(I)

-continued

(II)



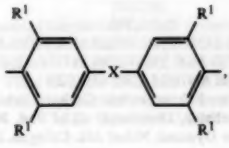
wherein

M represents H, alkali metal, ½ alkaline earth metal, Y or —R—OH, wherein

Y represents an alkyl-, cycloalkyl-, aryl- or alkylaryl-radical and

—R— represents an o-, m- or p-phenylene radical or a radical of the formula (IIa)

(IIa)

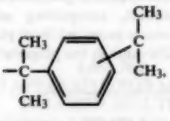


wherein

R^1 represents H, halogen as chlorine and bromine and C_1–C_3 alkyl and

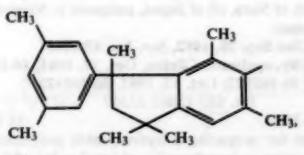
X represents a C_1–C_5-alkylene- or alkylidene-radical, a C_3–C_6-cycloalkylene or cycloalkylidene radical, a single bond, —S— or a radical of the formula (IIb)

(IIb)



in which the two alkylsubstituents may be in o-, m- or p-position to each other, or represents a radical of the formula (IIc)

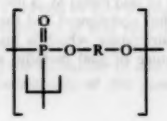
(IIc)



and from 99.5 to 0 mol % of phosphate units corresponding to formulae (III) and/or (IV):

(III)

(IV)



wherein

M is as defined in formula (I), and

R represents an o-, m- or p-phenylene radical or a radical of formula (IA), but not a radical of formula (IIc).

4,482,694

HIGH MOLECULAR WEIGHT AROMATIC POLYESTERS AND PROCESSES FOR THEIR PRODUCTION

Dieter Freitag, Krefeld; Uwe Hucks, Alpen, and Hans-Jürgen Meissner, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,120

Int. Cl.³ C08G *63/14, 63/18*

U.S. Cl. 528—176 **9 Claims**

1. A phase interface process for the production of aromatic polyesters from iso- and/or terephthalic acid dichlorides, diphenols, chain terminators and optionally branching agents, in the presence of an alkali hydroxide and from 0.2 to 3.0% by weight of tertiary amine, based on the aromatic dicarboxylic acid dichlorides used, wherein the process is carried out using an excess of from 0.3 to 1.8 mol% of the alkali hydroxide, based on phenolic hydroxyl, and the tertiary amine contains from 1 to 4 heteroatoms incorporated in a 4- to 7-membered cycloaliphatic compound, at least one of these heteroatoms being a tertiary nitrogen atom.

4,482,695

POLYAMIDE CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES

Robert B. Barbee; Roy K. Bass, and Burns Davis, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,397

Int. Cl.³ C08G *69/26*

U.S. Cl. 528—208 **6 Claims**

1. A container having an oxygen transmission rate of less than about 1.0 cc.mil/100 $in.^2$.24 hr.atm which is formed from a polyamide comprising the reaction product of

(A) m-xylylenediamine, p-xylylenediamine, or a mixture thereof, and

(B) oxydiacetic acid, 1,4-phenylenedioxydiacetic acid, 1,3-phenylenedioxydiacetic acid, or a mixture thereof.

4,482,696

AVOIDING AN EXPLOSIVE GAS PHASE IN GAS/LIQUID REACTIONS

Hans H. Schuster, Ludwigshafen; Hermann Dreher, Seeheim-Jugendheim, and Juergen Hambrecht, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 11, 1983, Ser. No. 465,760

Int. Cl.³ C08G *65/44*

U.S. Cl. 528—212 **6 Claims**

1. A method of avoiding a coherent explosive gas phase in a gas/liquid reactor having a tubular body which is closed at the top and into which one or more jets of liquid, which are fed from a liquid circulation and are directed downward, emerge from one or more nozzles located at the highest point of the reactor, and entrain a gas phase which is to be dispersed, introduce it into the liquid and finally produce complete dispersion of the gas, wherein, the said method comprises: before start-up of the liquid circulation, the inactive reactor is first charged with an amount of liquid reactant to a level leaving a gas space corresponding to the subsequent gas hold-up of dispersed bubbles under operating conditions at the top of the reactor, then said gas space is filled with a gas, at a pressure p_1, which is inert under the reaction conditions, and the gaseous reactant is fed to the reactor only when, under the action of the liquid

jet or jets, the inert gas and the liquid reactant have reached a hydrodynamic equilibrium wherein the total inert gas phase has been dispersed into a hold-up of dispersed bubbles so that a coherent gas phase no longer exists.

4,482,697

PROCESS, COMPLEX AND CATALYST FOR PREPARATION OF POLYPHENYLENE OXIDE

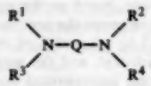
Deborah A. Haitko, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 474,604, Mar. 11, 1983,. This application May 16, 1983, Ser. No. 494,835

Int. Cl.³ C08G 65/44

U.S. Cl. 528—215 **21 Claims**

1. In a process for preparing a polyphenylene oxide which comprises oxidatively coupling a monohydroxy aromatic compound in the presence of a copper-halide-amine catlayst wherein at least one amine is a diamine, the improvement wherein said diamine has the formula



wherein Q is a lower hydrocarbon bridging radical in which the free valence bonds are attached to adjacent carbon atoms, each of R^1 and R^2 is a hydrocarbon or substituted hydrocarbon radical containing about 1–10 carbon atoms, wherein the substitutents do not materially alter the hydrocarbon character of the radical, and each of R^3 and R^4 is hydrogen or a saturated lower aliphatic radical, or R^3 and R^4 together form a divalent saturated aliphatic radical containing 2–4 carbon atoms; one of said radicals attached to each nitrogen atom being aromatic and the balance thereof being hydrogen, aliphatic or alicyclic.

4,482,698

THERMOSETTING COATING COMPOSITION CONTAINING A BLOCKED ACID AS CATALYST

Johan B. Reesink, Didam, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Aug. 8, 1983, Ser. No. 521,098

Claims priority, application Netherlands, Aug. 9, 1982, 8203131

Int. Cl.³ C08G 12/32

U.S. Cl. 528—242 **10 Claims**

1. A thermosetting coating composition containing an acid curable amino resin and an amount of a blocked acid corresponding to 0,1 to 10 percent by weight, calculated on the amino resin of potentially available sulphonic acid, characterized in that the blocked acid is an O-sulphonyl hydroxamic ester of the formula: $[RSO_2ONHCOO]_nA$, wherein n represents an integer from 1 to 5 and A, when n=1, has the meaning of a substituted or unsubstituted alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl or heterocyclic group or when n=2 to 5 has the meaning of substituted or unsubstituted alkylene, cycloalkylene, arylene or alkarylene group and R represents a substituted or unsubstituted alkyl, alkenyl, cycloalkyl, aryl or heterocyclic group.

4,482,699

LOW EMITTING AQUEOUS FORMULATIONS OF AMINOPLAST RESINS AND PROCESSES FOR MANUFACTURING THEM

James H. Williams, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Filed Jul. 25, 1983, Ser. No. 516,955

Int. Cl.³ C08G 12/12

U.S. Cl. 528—260 **12 Claims**

1. A four-stage process for preparing a urea-formaldehyde resin, that has two stages of condensation and two stages of methylolation, comprising:

(a) adding urea to a highly acidic aqueous solution of formaldehyde having an initial pH not above 2.5, at an elevated temperature of 50° C. or higher, that permits condensation to occur, until the mol ratio of formaldehyde to urea (F/U) is in the range from about 4.0:1 to 2.5:1;

(b) adjusting the pH substantially to a neutral or alkaline value for methylolation, then adding more urea at a temperature of at least 50° C. to an F/U mole ratio of 2.5:1 to 1.5:1, holding the reaction mixture at a temperature greater than 49° C. to permit methylolation to occur, then holding the mixture at reflux to force methylolation,

(c) adjusting the pH to the acid side, to a pH of 4.5 or higher, to initiate condensation and polymerization, and refluxing to a desired Gardner viscosity; then

(d) cooling to a temperature below the boiling point of water and adjusting the pH to the alkaline side for final methylolation, and adding more urea to achieve an F/U mole ratio of 2.3:1 to 1.1:1.

4,482,700

METHOD FOR THE PREPARATION OF LIGHT-COLORED POLYESTERS WITH THE USE OF TITANIUM CATALYSTS

Robert Kühnrich, Oer-Erkenschwick; Gerhard Schade, Witten, and Bernd Elmenthaler, Dortmund, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Dec. 29, 1983, Ser. No. 566,711

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300315

Int. Cl.³ C08G 63/34

U.S. Cl. 528—279 **11 Claims**

1. A method of preparing polyesters from polyfunctional alcohols and polybasic carboxylic acids and/or alkyl esters and/or anhydrides thereof, in the presence of catalytically active titanium compounds, comprising adding catalytic amounts of addition products prepared from phosphorous acid and monoepoxides as adjuvants in the preparation of the polyester.

4,482,701

HYDROLYZABLE POLYESTER RESINS, VARNISHES AND COATING COMPOSITIONS CONTAINING THE SAME

Naoki Yamamori, Minoo; Junji Yokoi, and Motoyoshi Yoshikawa, both of Nara, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

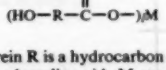
Filed Sep. 28, 1982, Ser. No. 426,155

Claims priority, application Japan, Oct. 17, 1981, 56-165921; Oct. 17, 1981, 56-165922; Oct. 17, 1981, 56-165923

Int. Cl.³ C08G 63/60

U.S. Cl. 528—295.5 **16 Claims**

1. A process for preparing a hydrolyzable polyester resin comprising reacting polycarboxylic acid and polyhydric alcohol components, which is characterized in that a metallic salt of hydroxy carboxylic acid of the formula:



wherein R is a hydrocarbon residue or residue of a half ester of a dicarboxylic acid, M stands for monovalent to tetravalent metal belonging to anyone of the groups Ia, Ib, IIa, IIb, IVa, VIIb and VIII of the Periodic Table, and l is an integer corresponding to the valency of said metal M, is used as at least part of said polyhydric alcohol component and the polycondensation is effected at a temperature which is no more than the decomposition temperature of said metallic salt of hydroxy carboxylic acid.

4,482,702

FL POLYESTERS

Teddy M. Keller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1983, Ser. No. 563,435
Int. Cl.³ C08G 63/68
U.S. Cl. 528—299 23 Claims

1. A prepolymer comprising the product of a polycarboxylic acid having at least one methylene group between each carboxylic group and any fluorinated carbon and an alcohol having at least two alcoholic carbons with 1 to 2 trifluoromethyl groups, 0 or 1 methyl groups and 0 or 1 hydrogens attached to each alcoholic carbon and no other pendant groups attached to said alcoholic carbons, said reactants having been reacted in non-stoichiometric ratios.

4,482,703

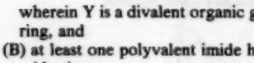
THERMOSETTING RESIN COMPOSITION COMPRISING DICYANAMIDE AND POLYVALENT IMIDE

Akio Takahashi, Hitachiota; Takeshi Shimazaki, Hitachi; Motoyo Wajima, Hitachi, and Hirosada Morishita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 435,766
Claims priority, application Japan, Oct. 23, 1981, 56-168787
Int. Cl.³ C08G 73/10
U.S. Cl. 528—322 7 Claims

1. A thermosetting resin composition comprising

(A) at least one dicyanamide compound represented by the formula:



NCHN—Y—NHCN (I)

wherein Y is a divalent organic group having an aromatic ring, and

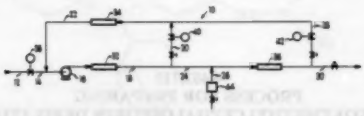
(B) at least one polyvalent imide having at least two maleimide rings.

4,482,704

METHOD AND APPARATUS FOR MULTIPLE RECYCLE POLYMER DILUTION

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Nov. 22, 1982, Ser. No. 443,286
Int. Cl.³ C08F 6/00; B01F 15/02
U.S. Cl. 528—480 33 Claims



1. A method for progressively diluting a polymer solution at an initial, higher concentration to a final, lower concentration without degrading the polymer, including the steps of:

(a) combining a starting polymer solution containing an initial higher concentration of polymer with a recycled polymer solution formed from a portion of said starting polymer solution, containing a lower concentration of polymer to form a first diluted polymer solution,

(b) introducing a diluent into said first diluted polymer solution to form a second diluted polymer solution having a lower concentration of polymer than the starting polymer solution and the first diluted polymer solution,

(c) diverting a portion of said second diluted polymer solution and utilizing it as said recycled polymer solution to form said first diluted polymer solution, and

(d) conveying the remainder of said second diluted polymer solution downstream of the point of diversion of said second diluted polymer solution to provide the final diluted polymer solution.

4,482,705

REMOVAL OF THE CATALYST FROM POLYPHENYLENE ETHERS

Juergen Hambrecht, Heidelberg; Rudi W. Reffert, Beindersheim; Volker Muench, Ludwigshafen; Adolf Echte, Ludwigshafen, and Johann Swoboda, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,612
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228662
Int. Cl.³ C08G 65/46
U.S. Cl. 528—486 8 Claims

1. A process for the preparation of a high molecular weight polyphenylene ether from a monohydric phenol, which is alkyl-substituted at the two ortho-positions but not at the para-position and may or may not be alkyl-substituted at the meta-position, by an oxidative coupling reaction with oxygen at from 10° to 50° C. in the presence of a catalyst complex obtained from a copper salt and an organic amine and in the presence of from 1 to 20 parts by weight of a solvent per part by weight of the monomeric phenol, and in the presence or absence of an activator, wherein the metal component of the catalyst is separated off, after the polymerization, by adding a polymeric polycarboxylic acid which is a homopolymer or copolymer comprising

(a) from 50 to 100% by weight of one or more unsaturated monofunctional acids of 3 to 10 carbon atoms and/or one or more difunctional acids or their anhydrides of 4 to 6 carbon atoms, and

(b) from 0 to 50% by weight of one or more monomers which do not possess acid function and can be copolymerized with (a), wherein the polymeric polycarboxylic acid or its resin is employed in the form of a 1–20% strength aqueous solution, and wherein the polymeric polycarboxylic acid is employed in an amount such that not less than one mole of carboxylic acid groups is present per mole of metal ions.

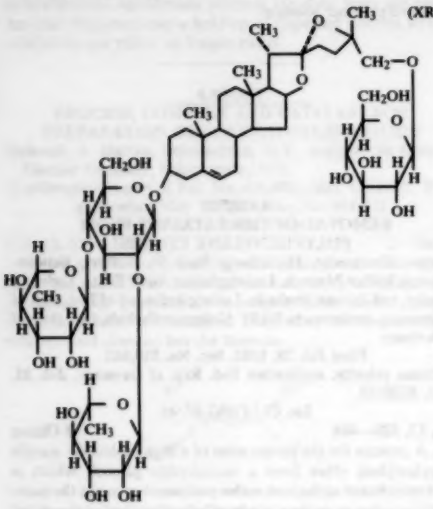
4,482,706

STEROID SAPONINS

Toshiaki Tomimatsu, and Kotaro Murakami, both of Tokushima, Japan, assignors to Tokiwa Yakuhin Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP82/00384, § 371 Date Apr. 20, 1983, § 102(e) Date Apr. 20, 1983, PCT Pub. No. WO83/01065, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 24, 1982, Ser. No. 491,964
Claims priority, application Japan, Sep. 25, 1981, 56-152488
Int. Cl.³ C07J 17/00
U.S. Cl. 536—6.1 2 Claims

1. A compound represented by the following formula (XR-1):


(XR-1)

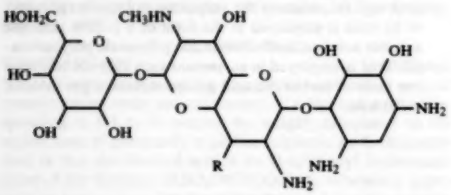
4,482,707

AMINOGLYCOSIDE ANTIBIOTIC SACCHAROCINS

Hideo Sakakibara; Shuzo Satoi; Masashi Awata; Hitoshi Sagai; Mitsuo Hayashi; Naoki Muto, and Masaki Takada, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 8, 1982, Ser. No. 447,967
Claims priority, application Japan, Dec. 8, 1981, 56-197953; Jun. 16, 1982, 57-104177
Int. Cl.³ C07H *15/22;* C12P *19/44*
U.S. Cl. 536—16.8 1 Claim

1. An antibiotic saccharocin of the formula



wherein R is hydrogen or hydroxyl, or a pharmaceutically acceptable acid addition salt thereof.

4,482,708

3', 5'-DINUCLEOSIDE PHOSPHATES OF 5,6-DICHLORO-1-β-D-RIBOFURANOSYL-1-BENZIMIDAZOLE AND METHODS OF MAKING AND USING THE SAME

Nicolas C. Nguyen, 360 E. 72nd St., New York, N.Y. 10021

Filed Aug. 9, 1982, Ser. No. 406,458
Int. Cl.³ C07H *15/12;* C12P *21/00*
U.S. Cl. 536—28 2 Claims

1. A compound selected from the group consisting of 5,6-dichloro-1-β-D-ribofuranosyl-1-benzimidazole-3'-yl-5,6-dichloro-1-β-D-ribofuranosyl-1-benzimidazole-5'-yl-phosphate and the pharmaceutically acceptable salts thereof.

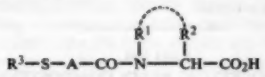
4,482,709

INCLUSION COMPOUNDS OF CYCLODEXTRIN WITH SULFUR-CONTAINING COMPOUNDS

Jun-ichi Iwao, Takarazuka; Tadashi Iso, Sakai, and Masayuki Oya, Ibaraki, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP82/00050, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02890, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 24, 1982, Ser. No. 432,929
Claims priority, application Japan, Feb. 28, 1981, 56-29060
Int. Cl.³ C08B *37/16;* A61K *31/73*
U.S. Cl. 536—46 12 Claims

1. An inclusion complex of cyclodextrin with a compound of formula [I] and pharmaceutically acceptable salts thereof,


[I]

wherein

A is straight or branched lower alkylene;

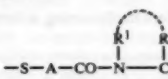
R^1 is hydrogen or lower alkyl;

R^2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, hydroxyphenyl-lower alkyl, hydroxy-lower alkyl, amino-lower alkyl, guanidino-lower alkyl, imidazolyl-lower alkyl, indolyl-lower alkyl, mercapto-lower alkyl and lower alkylthio-lower alkyl;

wherein

R^1 and R^2 may join to complete a pyrrolidine ring or a thiazolidine ring, and each of said rings may be substituted by a substituent selected from the group consisting of phenyl, phenyl substituted with hydroxy, lower alkoxy, halogen, nitro and sulfamoyl, and pyridyl;

R^3 is hydrogen or



said lower alkyl and lower alkoxy having 1 to 6 carbon atoms.

4,482,710

PROCESS FOR PREPARING 3-ALKOXYMETHYLCEPHALOSPORIN DERIVATIVES

Koichi Fujimoto; Eiji Nakayama, and Hideo Nakao, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,575
Claims priority, application Japan, Dec. 1, 1981, 56-193461
Int. Cl.³ C07D *501/04*
U.S. Cl. 544—28 19 Claims

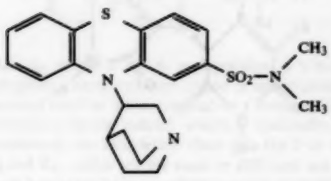
1. A process for preparing a 3-alkoxymethylcephalosporanic acid or salt thereof, which comprises reacting a 3-acetoxymethylcephalosporanic acid or salt thereof with a C_1–C_4 alkanol in the presence of halide ions selected from the group consisting of chloride ions and bromide ions, said halide ions being generated by a halogen compound selected from the group consisting of alkali metal chlorides and bromides, and alkaline earth metal chlorides and bromides, said halogen compound being in an amount of from 1 to 20 times the weight of said 3-acetoxymethylcephalosporanic acid or salt thereof.

4,482,711
PROCESS FOR THE PREPARATION OF N,N-DIMETHYL-10-[1-AZA-[2,2,2]-BICYCLO-3-OCTYL]-10H-2-PHENOTHIAZINE SULPHONAMIDE

Christian Renault, Taverny, France, assignor to Pharmindustrie, Gennevilliers, France

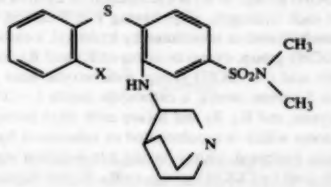
Continuation of Ser. No. 249,993, Mar. 30, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,116
Claims priority, application France, Jan. 13, 1981, 81 00442
Int. Cl.³ C07D 417/00
U.S. Cl. 544—42 15 Claims

1. Process for the preparation of the compound of formula:



(I)

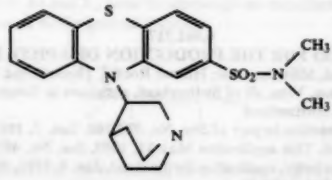
comprising the step of cyclizing the compound of formula:



(IV)

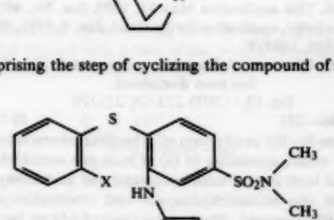
wherein X denotes a member of the group consisting of bromine and chlorine, such step being carried out in the presence of an alkali metal amide and an aprotic solvent.

14. The process for the preparation of the compound of formula:



(I)

comprising the step of cyclizing the compound of formula:



(IV)

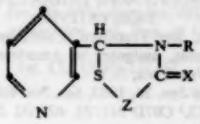
wherein X denotes a member of the group consisting of bromine and chlorine, such step being carried out in the presence of an alkali metal amide and an aprotic solvent selected from the group consisting of tetrahydrofuran, 1,2-dimethoxyethane, hexamethylphosphorous triamide, and their mixtures, at ambient temperature in the presence of an alcohol.

4,482,712
SUBSTITUTED 1-THIA-3-AZA-4-ONES

Eriks V. Krumkalns, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 327,311, Dec. 4, 1981, Pat. No. 4,436,739, which is a division of Ser. No. 188,189, Sep. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 110,868, Jan. 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 951,708, Oct. 16, 1978, abandoned. This application Nov. 21, 1983, Ser. No. 554,033
Int. Cl.³ C07D 401/04, 401/14
U.S. Cl. 544—54 5 Claims

1. A compound of the formula



wherein

R is C_3–C_{10} alkyl, C_3–C_8 cycloalkyl, methylallyl, phenyl, halophenyl, trifluoromethylphenyl, methoxybenzyl, methylbenzyl, halobenzyl, methylcyclohexyl, C_3–C_8 cycloalkyl (C_1–C_3)alkyl, α-methylbenzyl, 2-thiazolyl, nitrophenyl, phenoxyphenyl, (2-hydroxy-5-chloro)phenyl, (tetrahydro-2-furanyl)methyl, haloanilyl, trifluoromethylthiophenyl, methylthiophenyl, 2-norbornyl, furfuryl, 2-(1-methoxypropyl), methoxyphenyl, fluoro(C_1–C_2)alkoxyphenyl, 3,4-(methylenedioxy)phenyl, 3,4-(methylenedioxy)benzyl, xylyl, tolyl, or halotolyl;

X is oxygen or sulfur;

R^3 is hydrogen or methyl;

R^4 is hydrogen or C_1–C_6 alkyl; and

R^5 is hydrogen or methyl;

and acid addition salts thereof.

4,482,713
QUATERNARY AMMONIUM SALTS AND THEIR PREPARATION

Rainer Strickler, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,183
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 3126522
Int. Cl.³ C07D 295/08
U.S. Cl. 544—177 4 Claims

1. A process for the preparation of quaternary ammonium salts of the formula

$$[R^1R^2R^3N(A—O)_n—R^4]^+Z^-,$$

where R^1 and R^2 are identical or different and each is alkyl, aryl, aralkyl, alkylaryl, alkoxyalkyl or a (poly)alkylene glycol radical, or R^1 and R^2, together with the nitrogen atom, are a heterocyclic ring, or one or more substituents R^1 or R^2 are poly-functional so that the salt contains not less than 2 ammonium group, R^3 and R^4 are identical or different monovalent radicals of one or more alkylating agents R^3X or R^4X, where R^3 and R^4 are identical or different and each is alkyl, alkenyl or

aralk(en)yl and X is an alkylating substituent, A is alkylene of 2 to 10 carbon atoms, n is an integer and Z is either the substituent X or another salt-forming anion or a hydroxyl ion, wherein a tertiary alkanolamine of the formula

$$R^1R^2N(-A-O)_nH$$

with not less than one hydroxyl group per molecule is treated simultaneously or successively, with an alkylating agent R^3X and, in the presence of a phase transfer catalyst and an alkali metal hydroxide or an alkaline earth metal hydroxide base, an alkylating agent R^4X.

4,482,714

PYRAZINO[2',3',-3,4]PYRIDO[1,2-a]INDOLE DERIVATIVES

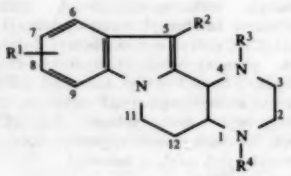
George Santroch, San Francisco, Calif., and Ivo Jirkovsky, Montreal, Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 26, 1983, Ser. No. 461,095

Int. Cl.³ C07D *241/36, 403/00, 221/16*

U.S. Cl. 544—343 **32 Claims**

1. A compound of the formula



in which R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl; R^2 is hydrogen or lower alkyl having one to three carbon atoms; and R^3 and R^4 each independently is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyclo(lower)alkyl, lower alkanoyl, hydroxy(lower)alkyl, lower alkoxycarbonyl(lower)alkyl, phenyl(lower)alkyl or phenoxy(lower)alkyl; or a therapeutically acceptable acid addition salt thereof.

32. An antihypertensive pharmaceutical composition, which comprises an effective amount of a compound of claim **1**, and a pharmaceutically acceptable carrier therefor.

4,482,715

PROCESS FOR THE PREVENTION OR REDUCTION OF DISCOLORATION OF SODIUM OR ZINC PYRITHIONE

Samuel I. Trotz, Orange, and Douglas A. Farmer, Jr., Madison, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Feb. 26, 1982, Ser. No. 352,813

Int. Cl.³ C07D *213/89*

U.S. Cl. 546—6 **10 Claims**

1. A process for producing zinc pyrithione having a white to off-white color which comprises

adding a reducing agent to an aqueous sodium pyrithione solution; then

reacting said sodium pyrithione solution with a zinc salt to form a zinc pyrithione product;

said reducing agent selected from the class consisting of alkali metal sulfites, alkali metal bisulfites, hydrazine, and mixtures thereof and the amount of said reducing agent being effective to prevent or reduce discoloration of said zinc pyrithione product.

4,482,716

DYESTUFFS AND THEIR USE IN PHOTOGRAPHIC MATERIAL

William E. Long, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

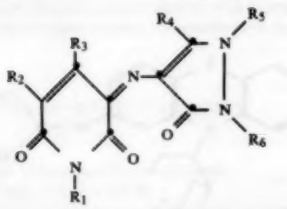
Filed Apr. 22, 1983, Ser. No. 487,352

Claims priority, application United Kingdom, Feb. 28, 1980, 8006849

Int. Cl.³ C07D *401/00, 211/00, 295/00*

U.S. Cl. 546—211 **4 Claims**

1. A dyestuff of the formula



where R_1 is hydrogen, alkyl having 2 to 10 carbon atoms which is unsubstituted or substituted by chlorine, bromine, hydroxyl, alkoxy having 1 to 4 carbon atoms or a carboxylic acid (—COOH) group, or R_1 is cyclopentyl or cyclohexyl, R_2 and R_3 are each hydrogen, alkyl having 1 to 8 carbon atoms which is unsubstituted or substituted by hydroxyl, a carboxylic acid (—COOH) group, cyano or nitro, or R_2 and R_3 are each a carboxylic acid (—COOH) group, a carboxylic ester group having 2 to 5 carbon atoms, a carboxylic amide ($—CONH_2$) group or cyano, and R_4, R_5 and R_6 are each alkyl having 1 to 6 carbon atoms which is unsubstituted or substituted by chlorine, bromine, hydroxyl, alkoxy having 1 to 4 carbon atoms or a carboxylic acid (—COOH) group, or R_4, R_5 and R_6 are each phenyl which is unsubstituted or substituted by chlorine, bromine, hydroxyl, cyano, nitro or a carboxylic acid (—COOH) group.

4,482,717

METHOD FOR THE PRODUCTION OF 3-PICOLINE

Rolf Dinkel, Münchenstein; Hilmar Roedel, Therwil, and James I. Grayson, Visp, all of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Continuation-in-part of Ser. No. 337,769, Jan. 7, 1982, abandoned. This application May 11, 1983, Ser. No. 493,505

Claims priority, application Switzerland, Jan. 9, 1981, 104/81; Mar. 12, 1981, 1685/81

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.³ C07D *213/08, 213/10*

U.S. Cl. 546—251 **19 Claims**

1. Process for the production of 3-picoline, characterized in that a first educt, consisting of (a) at least one acetaldehydeacetal, (b) at least one acetaldehydeacetal and acetaldehyde or (c) at least one acetaldehydeacetal and crotonaldehyde, is reacted with a second educt, consisting of (d) at least one formaldehydeacetal, (e) at least one formaldehydeacetal and formaldehyde, (f) hexamethylenetetramine or (g) hexamethylenetetramine and formaldehyde, in a liquid, aqueous phase at a temperature of 180° to 280° in a closed vessel in the presence of ammonia and/or ammonium ions and in the presence of an anion or anions of inorganic and/or organic acid or acids, which at 20° C. have an acid dissociation constant of 10^6 to 10^{-12}.

4,482,718

PROCESS FOR THE PREPARATION OF 2-(THIEN-2-YL)- AND 2-(THIEN-3-YL)-ETHYLAMINE DERIVATIVES

Isaac Chekroun, Toulouse, and Alain Heymes, Sisteron, both of France, assignors to Sanofi, Toulouse, France

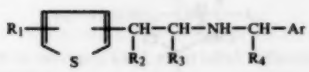
Filed Jun. 29, 1982, Ser. No. 393,387

Claims priority, application France, Jun. 30, 1981, 81 13062

Int. Cl.³ C07D *333/20, 409/12*

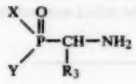
U.S. Cl. 546—284 **13 Claims**

1. Process for the preparation of 2-(thien-2-yl)- and 2-(thien-3-yl)-ethylamine derivatives of the general formula:



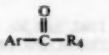
(I)

in which R_1, in the 2-, 3-, 4- or 5-position, is a hydrogen or halogen atom, a nitro, carboxyl, cyano or amino group, a linear or branched alkyl or alkoxy radical or a heterocyclic or non-heterocyclic aromatic radical, which is optionally mono- or polysubstituted, the aminoethyl chain is in the 2- or 3-position, R_2, R_3 and R_4, which are the same or different, are hydrogen atoms or heterocyclic or non-heterocyclic aromatic radicals, which are optionally mono- or polysubstituted, and Ar is a heterocyclic or non-heterocyclic aromatic radical, which is optionally mono- or polysubstituted, wherein a compound of the general formula:



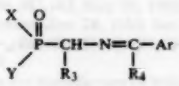
(II)

in which R_3 has the above-given meaning and X and Y, which may be the same or different, are alkyl, alkoxy, aryl, aryloxy, dialkylamino or diarylamino radicals, is condensed with a carbonyl compound of the general formula:



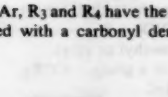
(III)

in which Ar and R_4 have the above-given meanings, to give a compound of the general formula:



(IV)

in which X, Y, Ar, R_3 and R_4 have the above-given meanings, which is treated with a base of the general formula $B^{\ominus}M^{\oplus}$ to give a carbanion of the general formula:

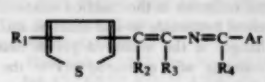


(V)

in which X, Y, Ar, R_3 and R_4 have the above-given meanings, which is reacted with a carbonyl derivative of the general formula:

(VII)

in which R_1 and R_2 have the above-given meanings, to give the compound of the general formula:



(VIII)

in which R_1, R_2, R_3, R_4 and Ar have the above-given meanings, which is treated with a reducing agent to give a compound of general formula (I).

4,482,719

PROCESS FOR OBTAINING 3-CYANOPYRIDINE

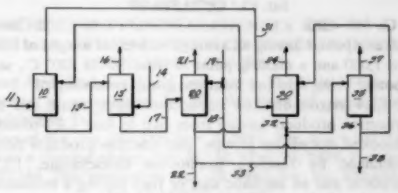
Beschke Helmut, Hanau; Dahm Ludwig, Alzenau, and Friedrich Heinz, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,434

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128956

Int. Cl.³ C07D *213/57*

U.S. Cl. 546—286 **20 Claims**



1. In a process for the recovery of 3-cyanopyridine from the gaseous mixture resulting from the catalytic reaction of 3-methylpyridine with ammonia and oxygen and treatment of the gaseous mixture with water, the improvement comprising in a first step treating the gaseous mixture at a temperature of about 30° to 60° C. with water and then in a second step treating the gaseous mixture remaining after the first step with water at a temperature between around 10° to 30° C. lower than the temperature in the first step.

4,482,720

CONTINUOUS PROCESS FOR PREPARING BENZOTHIAZYL DISULFIDE

Joel H. Kaplan, South Plainfield, and Robert C. Kinstler, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 758,222, Jan. 10, 1977, abandoned, which is a continuation-in-part of Ser. No. 640,583, Dec. 15, 1975, abandoned, which is a continuation of Ser. No. 461,036, Apr. 15, 1974, abandoned, which is a continuation of Ser. No. 230,079, Feb. 28, 1972, abandoned. This application Jan. 25, 1982, Ser. No. 342,318

Int. Cl.³ C07D *513/00*

U.S. Cl. 548—158 **5 Claims**

1. In a process for preparation of 2,2[1]-benzothiazyl disulfide by oxidation of 2-mercaptobenzothiazole with chlorine, the improvement which comprises the steps of:

a. simultaneously and continuously introducing below the surface of a vigorously agitated aqueous reaction mixture separate reactant streams of chlorine gas and an aqueous solution of alkali metal salt of 2-mercaptobenzothiazole in approximately stoichiometric proportions, while continuously measuring the oxidation-reduction potential and the pH of said reaction mixture and maintaining the reaction mixture temperature in the range from about 50° C. to 60° C., and

b. varying the rate of addition of chlorine gas in response to

changes in the measured oxidation-reduction potential as needed to continuously maintain said measured potential at a particular emf corresponding to the emf at zero concentration of the reactants in the reaction mixture, and

c. adding alkali metal hydroxide to said reaction mixture in response to changes in the measured pH as needed to continuously maintain said measured pH in the range about pH 6 to 9, and

d. removing precipitated 2,2[1]-benzothiazyl disulfide product from the reaction mixture.

4,482,721

1,2,4-TRIAZOLE-BLOCKED POLYISOCYANATES AS CROSS-LINKERS FOR LACQUER BINDERS

Christian Wegner, Cologne; Hanns-Peter Müller, Leverkusen, and Hans J. Kreuder, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 21,959, Mar. 19, 1979, abandoned. This application Jun. 11, 1982, Ser. No. 387,463

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1978, 2812252

Int. Cl.[3] C07D *249/08*

U.S. Cl. 548—262 **2 Claims**

1. A compound having an average molecular weight of from 306 to 1,000 and a melting point of from 50° to 220° C., said compound being selected from the group consisting of

(a) 1,2,4-triazole-blocked isophorone diisocyanate and (b) reaction products having from two to four 1,2,4-triazole blocked isocyanate groups, said reaction products being obtained by reacting isophorone diisocyanate, 1,2,4-triazole and an aliphatic diol or triol having a molecular weight of 62 to 200.

4,482,722

ESTER OF METRONIDAZOLE WITH N,N-DIMETHYLGLYCINE AND ACID ADDITION SALT THEREOF

Pia Thorbek; Hans Bundgaard, both of Horsholm, and Claus Larsen, Lejre, all of Denmark, assignors to A/S Dumex (Dumex Ltd.), Copenhagen, Denmark

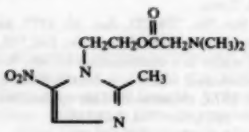
Filed Jun. 8, 1983, Ser. No. 502,210

Claims priority, application Denmark, Jun. 11, 1982, 2643/82

Int. Cl.[3] C07D *233/95*

U.S. Cl. 548—338 **2 Claims**

1. A metronidazole ester having the formula I:



(I)

and acid addition salts thereof.

4,482,723

PROCESS FOR PREPARATION OF 4-ACETYL-2-SUBSTITUTED-IMIDAZOLES

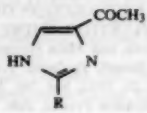
Lawrence A. Reiter, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,787

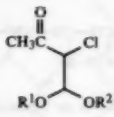
Int. Cl.[3] C07D *233/64*

U.S. Cl. 548—343 **6 Claims**

1. A process for preparation of a compound of the formula



wherein R is (C_1-C_6)alkyl or $(CH_2)_nAr$ where Ar is phenyl or phenyl monosubstituted by Cl, Br, F, CH_3 or OCH_3 and n is 2 to 4; which comprises contacting a compound of the formula



wherein R^1 and R^2 are each (C_1-C_4)alkyl or when taken together R^1 and R^2 are (C_2-C_4)alkylene with an amidine of the formula

in the presence of reaction-inert solvent and a base at a temperature of from 50° C. up to the reflux temperature of the solvent.

4,482,724

BISIMIDAZOLINES

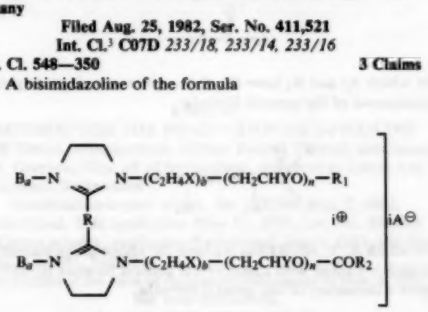
Werner Ritschel, Hofheim am Taunus; Helmut Diery, Kelkheim, and Martin Hille, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,521

Int. Cl.[3] C07D *233/18, 233/14, 233/16*

U.S. Cl. 548—350 **3 Claims**

1. A bisimidazoline of the formula



wherein

R denotes the alkyl skeleton of a dimerized fatty acid having 22 to 42 C atoms,

X denotes an oxygen atom or a group of the formula $>N-B_m$,

B denotes hydrogen, methyl, ethyl, benzyl or a group of the formula $-(CH_2CHYO)_n-R_1$,

Y denotes hydrogen, methyl or ethyl,

R_1 denotes hydrogen or a group $-COR_2$,

R_2 denotes C_1-C_{22} alkyl,

a denotes 0 or 1; b denotes a number up to 4 which is at least 1; m denotes 1 or 2, n denotes a number from 0 to 100, i denotes a number from 0 to 2b+2; and A denotes an anion.

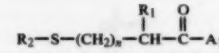
4,482,725

S-ACYLATION PRODUCTS OF MERCAPTOACYL AMINO ACIDS AND CARBOXYL GROUP CONTAINING DIURETICS

Miguel A. Ondetti, and Denis E. Ryono, both of Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 3, 1980, Ser. No. 136,842
Int. Cl.³ C07D 207/16
U.S. Cl. 548—533 5 Claims

1. A compound having the formula



wherein R_1 is hydrogen, alkyl, phenylalkyl, trifluoromethyl, or pentafluoroethyl;

R_2 is 5-(aminosulfonyl)-4-chloro-2-[(2-furanylmethyl-)amino]benzoyl, 5-(aminosulfonyl)-2-[(2-furanylmethyl-)amino]-4-(phenyloxy)benzoyl, 3-(aminosulfonyl)-5-(butylamino)-4-(phenyloxy)benzoyl, 5-(aminosulfonyl)-4-(phenyloxy)-3-(1-pyrrolidinyl)benzoyl, 5-(aminosulfonyl)-4-(benzoyl)-3-[[(3-thienyl)methyl]oxy]benzoyl, [2,3-dichloro-4-(2-methylene-1-oxobutyl)phenyloxy]acetyl, [[4-(2,2-diacetylvinyl)-2,3-dichlorophenyl]oxy]acetyl, or [[2,3-dichloro-4-(2-thienylcarbonyl)phenyl]oxy]acetyl;

A_1 is an α-amino or α-imino acid residue, or ester thereof, joined to the adjacent carbonyl group to form an amide linkage; and

n is 1 or 2.

4,482,726

PROCESS FOR THE PRODUCTION OF MALEIC ANHYDRIDE

Carl A. Udovich, Joliet, and William S. Eryman, Bolingbrook, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 382,182, May 26, 1982, Pat. No. 4,418,003. This application Jun. 28, 1983, Ser. No. 509,151
Int. Cl.³ C07D 307/60
U.S. Cl. 549—260 12 Claims

1. A process for the manufacture of maleic anhydride which process comprises contacting a feedstock comprising n-butane and a gas containing molecular oxygen in the vapor phase with a catalyst which comprises a phosphorus vanadium mixed oxide, the atomic ratio of vanadium to phosphorus being in the range of about 0.5:1 to about 1.1:1 wherein the catalyst in the initial solid phase has a characteristic initial powder X-ray diffraction pattern, using copper K-alpha radiation as follows:

	Line Position	
d angstrom	2.0	Intensity
8.75	10.1	38
5.7	15.2	23
4.5	19.4	24
3.7	24.0	21
3.3	26.8	32
3.1	28.3	24
2.9	30.0	100

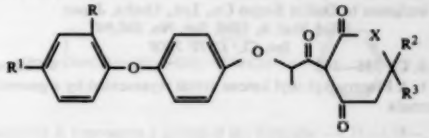
4,482,727

CERTAIN 1,3-CYCLOHEXANEDIONE ADDUCTS OF SUBSTITUTED PHENOXYPHENOXYPROPIONIC ACIDS AND THEIR USE AS AN HERBICIDE

David L. Lee, Martinez, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 1, 1983, Ser. No. 510,141
Int. Cl.³ C07D 309/32; C07C 49/517
U.S. Cl. 549—291 6 Claims

1. A compound having the structural formula



wherein R is hydrogen or halogen, R^1 is halogen or trifluoromethyl, R^2 is hydrogen or C_1–C_4 alkyl, R^3 is hydrogen or C_1–C_4 alkyl and X is oxygen or methylene.

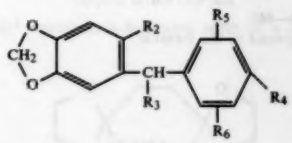
4,482,728

POLYBUTYLBENZYLPHENOLS AND BENZYL-3,4-METHYLENEDIOXBENZENES IN INSECT POPULATION CONTROL

Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 318,531, Nov. 5, 1981, Pat. No. 4,342,777, which is a division of Ser. No. 25,132, Mar. 29, 1979, Pat. No. 4,357,344. This application Apr. 20, 1982, Ser. No. 370,020
Int. Cl.³ C07D 317/44
U.S. Cl. 549—435 7 Claims

1. A compound of the structure



wherein

R_2 is lower alkoxy containing from 1 to 6 carbon atoms or lower alkenyl containing from 2 to 6 carbon atoms,

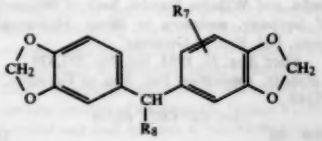
R_3 is hydrogen or lower alkyl containing from 1 to 6 carbon atoms,

R_4, R_5, and R_6 are independently hydrogen, lower alkyl containing from 1 to 6 carbon atoms, and lower alkoxy containing from 1 to 6 carbon atoms, wherein, if R_4, R_5, and R_6 are hydrogen and R_3 is methyl then R_2 must be lower alkoxy containing from 2 to 5 carbon atoms, and

wherein if

R_2 is alkoxy and R_3 is hydrogen or methyl, then only one of R_4, R_5, or R_6 can be alkoxy.

6. A compound of the structure



wherein

R_7 is lower alkyl containing 1 to 6 carbon atoms, lower

alkoxy containing from 2 to 6 carbon atoms, or lower alkenyl containing from 2 to 6 carbon atoms, and

R_8 is hydrogen or lower alkyl containing from 1 to 6 carbon atoms.

4,482,729

FLUOROALKYL SILYL KETENE ACETALS AND A PROCESS FOR PREPARING THE SAME

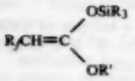
Nobuo Ishikawa, and Takeshi Nakai, both of Yokohama, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 4, 1984, Ser. No. 586,947

Int. Cl.³ C07F 7/08

U.S. Cl. 556—446 **6 Claims**

1. A Fluoroalkyl silyl ketene acetal represented by a general formula



wherein R_f represents a fluoroalkyl group, and R and R' are the same or different and each represents an alkyl group.

4,482,730

SYNTHESIS OF DIOXABICYCLO[3.2.1]OCTANES AND OXEPANES

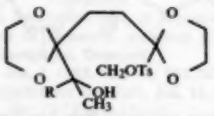
Zoltan G. Hajos, Princeton, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 305,019, Sep. 24, 1981, Pat. No. 4,387,234, which is a division of Ser. No. 141,524, Apr. 18, 1980, Pat. No. 4,322,353. This application Mar. 16, 1983, Ser. No. 475,986

Int. Cl.³ C07D 317/00

U.S. Cl. 549—448 **3 Claims**

1. A compound of the formula



wherein R is a straight or branched chain alkyl group having 2–10 carbon atoms and Ts is a tosyl group.

2. The compound of claim 1 wherein R is pentyl.

3. The compound of claim 1 wherein R is propyl.

4,482,731

PROCESS FOR THE PREPARATION OF TRANS-3-(Z-2-CHLORO-2-ARYL-VINYL)-2,2-DIMETHYL-CYCLOPROPANE-1-CARBOXYLIC ACID DERIVATIVES, AND THE USE OF INTERMEDIATE PRODUCTS IN AGENTS FOR COMPATING PESTS

Rainer Fuchs, and Wilhelm Stendel, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

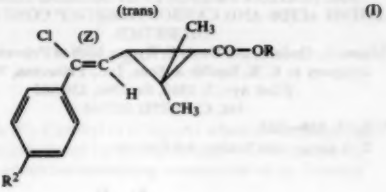
Filed Aug. 28, 1981, Ser. No. 297,479

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035149

Int. Cl.³ C07C 69/76

U.S. Cl. 560—08 **13 Claims**

1. A process for the preparation of a trans-3-(Z-2-chloro-2-aryl-vinyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid derivative of the formula



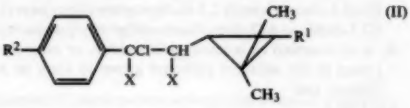
(I)

in which

R^2 represents a hydrogen or chlorine atom, and

R represents a hydrogen atom, an alkali metal or one equivalent of an alkaline earth metal, an optionally substituted ammonium ion, an alkyl radical, or a phenoxybenzyl radical which is optionally substituted by alkyl, alkenyl, alkinyl, halogen and/or cyano,

which comprises reacting 1 to 2 moles of a trans-3-(1,2-dihalogen-2-chloro-2-aryl-ethyl)-2,2-dimethyl-cyclopropanel-1-carboxylic acid derivatives of the formula



(II)

in which

R^2 represents a hydrogen or chlorine atom,

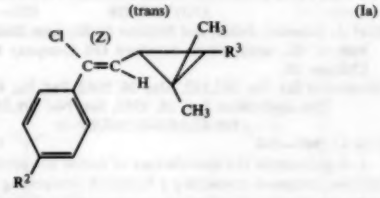
R^1 represents a cyano, acetyl, chlorocarbonyl or a —COOR radical,

wherein

R has the abovementioned meaning, and

X represents a chlorine or bromine atom,

per mol dehalogenating agent suitable for the elimination of two vicinal halogen atoms, at a temperature between 0° and 150° C. and if R^1 in the compound of formula (II) does not denote the —COOR radical, the product of the formula



(Ia)

in which

R^2 represents hydrogen or chlorine and

R^3 represents cyano, acetyl or chlorocarbonyl, is converted into a compound of the formula (I).

4,482,732

PROCESS OF MANUFACTURING DIARYL ESTERS OF DICARBOXYLIC ACIDS

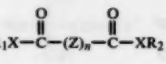
Gautam R. Ranade, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Sep. 24, 1982, Ser. No. 422,793

Int. Cl.³ C07C 67/08

U.S. Cl. 560—86 **18 Claims**

1. A process for preparing esters which comprises reacting a monohydroxy aromatic compound with at least one dicarboxylic acid in a reactor having a distillation means, said acid being represented by the formula:



wherein X is oxygen or sulfur, Z is alkylene, —Ar— or —Ar—Y—Ar— where Ar is aromatic, Y is alkylene of 1 to 10 carbon atoms, haloalkylene, —O—, —SO—, $-SO_2-$, $-SO_3-$, —CO—,

or GN=, and G is alkyl, haloalkyl, aryl, haloaryl, alkylaryl, haloalkylaryl, arylalkyl, haloarylalkyl, cycloalkyl and halocycloalkyl, n is 0 or 1, and R_1 and R_2 are independently selected from the group consisting of hydrogen and lower alkyl, said reaction being conducted at a temperature between about 220° to about 300° C., continuously removing distillate from said distillation means at a rate of about 0.01 to about 0.7 parts by weight per hour per part by weight of acid charged to the reactor, said distillate including a by-product of said reaction comprising water and/or lower alkyl alcohol(s), and varying the reflux ratio in said distillation means during the course of the reaction according to a predetermined pattern.

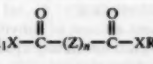
4,482,733

PROCESS OF MANUFACTURING DIARYL ESTERS OF DICARBOXYLIC ACIDS

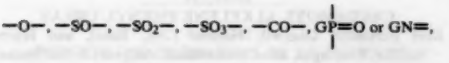
Gautam R. Ranade, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Sep. 24, 1982, Ser. No. 422,794
Int. Cl.³ C07C 67/08
U.S. Cl. 560—86 **10 Claims**

1. A process for preparing esters which comprises reacting a monohydroxy aromatic compound with at least one dicarboxylic acid in a reactor having a distillation means, said acid being represented by the formula:



wherein X is oxygen or sulfur, Z is alkylene, —Ar— or —Ar—Y—Ar— wherein Ar is aromatic, Y is alkylene of 1 to 10 carbon atoms, haloalkylene,



and G is alkyl, haloalkyl, aryl, haloaryl, alkylaryl, haloalkylaryl, arylalkyl, haloarylalkyl, cycloalkyl and halocycloalkyl, n is 0 or 1, and R_1 and R_2 are independently selected from the group consisting of hydrogen and lower alkyl, continuously removing a by-product of said reaction comprising water and/or lower alkyl alcohol(s) through said distillation means, said reaction being conducted at a temperature between about 220° C. and about 300° C., said temperature being increased within said range during the course of the reaction according to a predetermined pattern.

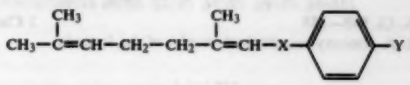
4,482,734

POLYPRENYL COMPOUNDS

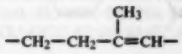
Isao Yamatsu, Ushikumachi; Takeshi Suzuki, Ushikumachi; Shinya Abe, Kukizakimachi; Yuichi Inai, Tokyo; Yoshikazu Suzuki, Ichinomiya, and Osamu Tagaya, Gifu, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 504,769
Claims priority, application Japan, Jun. 22, 1982, 57-106204
Int. Cl.³ C07C 69/76
U.S. Cl. 560—104 **11 Claims**

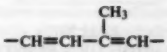
1. Polyprenyl compounds of the general formula:



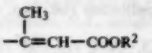
wherein X represents a group of the formula: —CH=CH—, a group of the formula:



or a group of the formula:



and Y represents a group of the formula: $-COOR^1$ in which R^1 represents a hydrogen atom or a lower alkyl group or a group of the formula:



in which R^2 represents a hydrogen atom or a lower alkyl group.

4,482,735

PROCESS FOR PREPARATION OF METHYL METHOXYACETATE

Richard S. Threlkel, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 29, 1983, Ser. No. 537,183
Int. Cl.³ C07C 69/708
U.S. Cl. 560—187 **11 Claims**

1. A process for the preparation of methyl methoxyacetate which comprises reacting methanol with carbon monoxide in the absence of formaldehyde and in the presence of a hydrogen fluoride catalyst and an oxidizing agent comprising

(1) at least a stoichiometric amount of a cobalt (III) salt; or

(2) a catalytic amount of a Group IB, Group VIIB or Group VIII metal salt and at least a stoichiometric amount of nitric acid or hydrogen peroxide, at a temperature in the range of about −80° C. to 120° C. and a carbon monoxide partial pressure in the range of about 5 to 5,000 psig.

4,482,736

HERBICIDALLY ACTIVE SUBSTITUTED PHENOXYCINNAMIC ACID DERIVATIVES

Heinz Forster, Wuppertal; Ludwig Eue, Leverkusen, and Robert Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

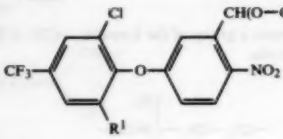
Division of Ser. No. 318,899, Nov. 6, 1981, Pat. No. 4,435,208. This application Jul. 14, 1983, Ser. No. 513,933

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044810

Int. Cl.[3] **C07C** *67/02, 121/00, 121/38, 121/34, 121/20, 121/28, 121/64, 79/46, 79/34, 79/22;* **A01N** *31/00*

U.S. Cl. 560—255 **1 Claim**

1. A phenoxybenzaldehyde acylal of the formula



in which

R^1 represents a hydrogen or chlorine atom.

4,482,737

PREPARATION OF N-SUBSTITUTED N-ISOCYANATOCARBONYL-CARBAMATES

Engelbert Kühle, Bergisch-Gladbach, and Hermann Hagemann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 3, 1982, Ser. No. 439,101

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146230

Int. Cl.[3] **C07C** *125/065, 125/067*

U.S. Cl. 560—115 **11 Claims**

1. A process for the production of an N-substituted N-isocyanatocarbonyl-carbamate of the formula

in which R and R^1 each independently is an alkyl radical having 1 to 20 carbon atoms, or an alkenyl or alkinyl radical having 2 to 10 carbon atoms, each optionally substituted by alkoxy or alkylthio having 1 to 4 carbon atoms, halogen, cyano and/or nitro; a cycloalkyl radical having 3 to 8 carbon atoms, or a cycloalkenyl radical having 5 or 6 carbon atoms and 1 or 2 double bonds, each optionally substituted by alkyl having 1 to 4 carbon atoms; an aryl radical having 6 to 10 carbon atoms in the aryl part and 1 to 6 carbon atoms in the alkyl part, and optionally substituted by alkyl or alkoxy having 1 to 4 carbon atoms, halogen, nitro, cyano and/or trifluoromethyl; an aralkenyl radical having 6 to 10 carbon atoms in the aryl part and 1 to 6 carbon atoms in the alkenyl part; or an aryl radical having 6 to 10 carbon atoms and optionally substituted by alkyl or alkoxy having 1 to 4 carbon atoms, halogen, cyano, nitro, trifluoromethyl and/or a fused heterocyclic ring, comprising reacting an N-substituted carbamic acid ester of the formula

with chlorocarbonyl isocyanate of the formula

at a temperature between about 50° and 200° C. in a diluent.

6. An N-substituted N-isocyanatocarbonylcarbamate of the formula

in which

R is an optionally substituted C_1 to C_{20} alkyl, C_2 to C_{10} alkenyl or C_2 to C_{10} alkinyl radical an optionally substituted C_3 to C_8 monocyclic cycloalkyl or C_5 or C_6 cycloalkenyl radical, an optionally substituted aralkyl radical having 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the alkyl part, an optionally substituted aralkenyl radical having 6 to 10 carbon atoms in the aryl part and 2 to 6 carbon atoms in the alkenyl part, or an optionally substituted C_6 to C_{10} aryl radical, and

R^2 is an optionally substituted C_3 to C_8 monocyclic cycloalkyl or C_5 or C_6 cycloalkenyl radical, an optionally substituted aralkyl radical having 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the alkyl part, an optionally substituted aralkenyl radical having 6 to 10 carbon atoms in the aryl part and 2 to 6 carbon atoms in the alkenyl part, or an optionally substituted C_6 to C_{10} aryl radical.

4,482,738

PROCESS FOR PREPARING SEMICARBAZIDE HYDROCHLORIDE

Eugene F. Rothgery, North Branford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Aug. 1, 1983, Ser. No. 519,471

Int. Cl.[3] **C07C** *133/02*

U.S. Cl. 564—37 **8 Claims**

1. A process for making semicarbazide hydrochloride comprising the steps of:

(a) reacting an aqueous hydrazine solution with urea at a temperature from about 80° C. to about 130° C. and at a mole ratio of hydrazine to urea from about 0.9:1 to about 1.2:1 to form a reaction mixture comprising semicarbazide, water and alcohol-insoluble by-products;

(b) removing substantially all of the water from the reaction mixture;

(c) mixing a sufficient amount of an alcohol with the water-deleted reaction mixture to dissolve said semicarbazide and to precipitate said alcohol-insoluble by-products from the resulting alcohol solution;

(d) removing said precipitated alcohol-insoluble by-products from said alcohol solution;

(e) adding a sufficient amount of anhydrous hydrogen chloride to said alcohol solution to form and precipitate semicarbazide hydrochloride; and

(f) recovering said semicarbazide hydrochloride from said alcohol solution.

4,482,739

CARBAMOYL ALKYLENE PHENYL UREAS

Karl Bernauer, Oberwil; Helmut Link, Basel, and Harro Stohler, Binningen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

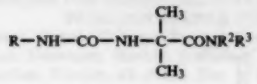
Division of Ser. No. 330,364, Dec. 14, 1981, Pat. No. 4,407,814, which is a continuation of Ser. No. 118,004, Feb. 4, 1980, abandoned, which is a continuation of Ser. No. 954,073, Oct. 24, 1978, abandoned. This application May 12, 1983, Ser. No. 493,855

Claims priority, application Luxembourg, Oct. 28, 1977, 78407; Switzerland, May 19, 1978, 5465/78; Sep. 6, 1978, 9367/78

Int. Cl.[3] **C07C** *127/19*

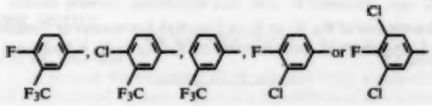
U.S. Cl. 564—54 **1 Claim**

1. A compound of the formula



IIa

wherein R is



and both of R^2 and R^3 are lower alkyl.

4,482,740

5-PHENYLCYCLOHEXENONE DERIVATIVES

Isao Iwataki; Akira Nakayama; Minoru Kaeriyama; Hisao Ishikawa; Hideo Hosaka; Kenichi Kohara, and Shozo Yamada, all of Kanagawa, Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

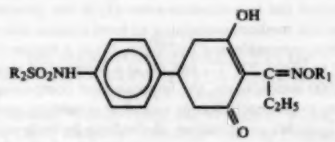
Filed Dec. 27, 1982, Ser. No. 453,499

Claims priority, application Japan, Dec. 29, 1981, 56-210452

Int. Cl.³ C07C *143/75*; C07F *1/08*

U.S. Cl. 564—99 **1 Claim**

1. A compound having the formula



wherein

R_1 is ethyl or allyl; and

R_2 is alkyl having 1 to 4 carbon atoms;

and a metal salt of said compound selected from the group consisting of alkali metal salts and calcium salts.

4,482,741

PREPARATION OF XYLYLENEDIAMINE

Paul R. Kurek, Schaumburg, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 9, 1984, Ser. No. 569,367

Int. Cl.³ C07C *85/12*

U.S. Cl. 564—415 **13 Claims**

1. A process for the preparation of a xylylenediamine which comprises treating a phthalonitrile with hydrogen at treating conditions in the presence of ammonia and a catalyst comprising cobalt promoted with titanium composited on a solid support, said treatment being effected in the presence of a solvent comprising a xylylenediamine and recovering the resultant xylylenediamine.

4,482,742

PROCESS FOR PREPARING OF 3,3'-DIAMINO DIPHENYLSULFONES

Keizaburo Yamaguchi; Kenichi Sugimoto, and Yoshimitsu Tanabe, all of Tokyo, Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

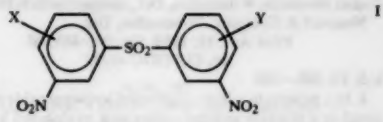
Filed Apr. 12, 1983, Ser. No. 466,498

Claims priority, application Japan, Feb. 18, 1982, 57-23516; Feb. 26, 1982, 57-28967; May 21, 1982, 57-84890; Dec. 23, 1982, 57-224977

Int. Cl.³ C07C *85/00, 85/11, 85/24*

U.S. Cl. 564—412 **6 Claims**

1. A process for the preparation of 3,3'-diamino diphenylsulfones which comprises catalytically reducing and dehalogenating a diphenylsulfone compound of formula I



I

wherein X is a halogen atom and Y is hydrogen or a halogen atom in the presence of a reducing catalyst and a dehydrohalogenating agent.

4,482,743

HYDROXYALKYL BIS(DIALKYLAMINOALKYL)AMINE MANUFACTURE

Ernest L. Yeakey, and Robert L. Zimmerman, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 28, 1983, Ser. No. 518,170

Int. Cl.³ C07C *85/00, 85/02, 85/18*

U.S. Cl. 564—477 **6 Claims**

1. A process for preparing relatively pure hydroxyalkyl bis(dialkylaminoalkyl)amine by adding to a mixture of dialkylaminoalkylaminoalkylnitrile and bis(dialkylaminoalkyl)amine under alkoxylation conditions sufficient alkylene oxide to react with substantially all of the bis(dialkylaminoalkyl)amine and then separating the reacted materials by distillation.

4,482,744

METHANOL CONVERSION PROCESS

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 440,894

Int. Cl.³ C07C *149/10, 149/06*

U.S. Cl. 568—60 **6 Claims**

1. A method for converting methanol into sulfur-containing compounds, selected from the group consisting essentially of mercaptans, sulfides and disulfides, and C_1 to about C_4 hydrocarbons comprising contacting from about a 10:1 to about 1:10 ratio by volume of a methanol-to-water mixtue with an effective amount of spent shale in a suitable reaction medium, heating said medium and the materials contained therein to about 275° to 350° C. with the proviso that the pressure not exceed from about 1450 to about 2750 psig for about 1 to 4 hours, and thereafter cooling said reaction medium, separating the products produced therein and recovering said sulfur-containing compounds and hydrocarbons.

4,482,745

PROCEDURE FOR PREPARING 1,3-DIPHENYL-1,3-PROPANEDIONE

Donald R. Maulding, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 2, 1983, Ser. No. 548,063

Int. Cl.³ C07C *45/45*

U.S. Cl. 568—314 **2 Claims**

1. A method for the preparation of 1,3-diphenyl-1,3-propanedione comprising admixing a mixture containing acetophenone with from 5 to 10 molar equivalents of methyl benzoate in the presence of from 1 to 2 molar equivalents of calcium oxide in a temperature range of from 150° to 200° C. for from three to six hours under a nitrogen atmosphere while continuously removing methyl alcohol as it is formed.

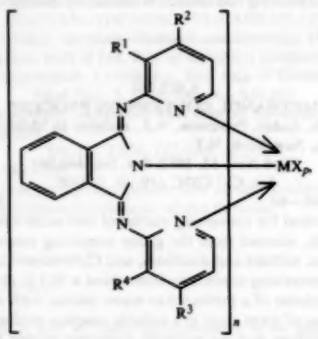
4,482,746

STAGED CATALYST PROCESS FOR CYCLOHEXYL HYDROPEROXIDE DECOMPOSITION

Joshua Hermolin, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 11, 1983, Ser. No. 483,665
Int. Cl.³ C07C 45/53
U.S. Cl. 568—342 8 Claims

1. In a process in which cyclohexyl hydroperoxide is decomposed in a reaction mixture comprising cyclohexyl hydroperoxide and cyclohexane to produce cyclohexanone and cyclohexanol, the improvement comprising contacting the reaction mixture, at a temperature from about 80° C. to about 130° C. and at a pressure from about 69 kPa to about 2760 kPa, with two catalyst compositions sequentially for a preselected reaction period, such that the reaction mixture is contacted with a catalytic amount of the first of said catalyst compositions only for about 10 to about 80 percent of the reaction period, and contacted with a catalytic amount of a mixture of the first and second catalyst compositions for the remainder of the preselected reaction time, wherein the first catalyst composition consists essentially of a cyclohexane-soluble chromium(III) salt of an organic acid selected from the group consisting of 2-ethylhexanoic acid, naphthenic acids, monoalkylarene or dialkylarene sulfonic acids, monoalkyl or dialkyl phosphoric acids or mixtures thereof, lauric acid, stearic acid, palmitic acid or linoleic acid, and the second catalyst composition consists essentially of one or more transition metal complexes having the structural formula



wherein the primary ligand is the entity in brackets;

M is Co, Mn or Fe;

R^1, R^2, R^3 and R^4 are independently hydrogen or methyl;

X is an ancillary anionic ligand;

n is 1 or 2; and

p is 0, 1 or 2, provided that n+p is 2 or 3; with the proviso that when there are two primary ligands, the values of R^1, R^2, R^3 and R^4 can be different for each ligand and when there are two ancillary anionic ligands, the value of X can be different.

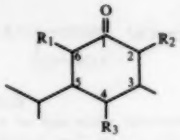
4,482,747

SUBSTITUTED METHYL ISOPROPYL OXOCYCLOHEXANE DERIVATIVES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

Philip T. Klemarczyk, Old Bridge, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 343,571, Apr. 26, 1982, Pat. No. 4,451,403. This application Nov. 14, 1983, Ser. No. 551,487
Int. Cl.³ C07C 49/603
U.S. Cl. 568—376 1 Claim

1. The compound having the structure:



wherein one of R_1, R_2 or R_3 is 2-methyl-1-propenyl or 2-methyl-1-propylidenyl, and the other of R_1, R_2 or R_3 is hydrogen.

4,482,748

HYDROCARBONYLATION

Frank B. Booth, Placentia, Calif., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 464,657, Apr. 26, 1974, abandoned, which is a continuation of Ser. No. 81,502, Oct. 16, 1970, abandoned, which is a continuation of Ser. No. 642,191, May 29, 1967, abandoned. This application Jul. 19, 1978, Ser. No. 926,046
The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.
Int. Cl.³ C07C 45/50
U.S. Cl. 568—454 4 Claims

1. In a process for hydroformylating acyclic olefins having 2 to about 8 carbon atoms to form aldehydes, wherein the process is carried out in a reaction zone: (1) in the presence of a liquid reaction medium containing an inert organic solvent, (2) with carbon monoxide and hydrogen, (3) at a temperature of about 50° to about 200° C., and (4) at a pressure of about 1 to about 10,000 atmospheres, the improvement comprising:

charging to the reaction zone a catalyst consisting essentially of a complex combination of rhodium hydride with carbon monoxide and an organic ligand of the formula, wherein R is aryl of 6 to 9 carbon atoms.

4,482,749

HYDROFORMYLATION PROCESS

Alan J. Dennis, Middlesbrough; George E. Harrison, Billericay, and James P. Wyber, Stockton-on-Tees, all of England, assignors to Davy McKee (London) Limited, London, England

Filed Jun. 7, 1983, Ser. No. 501,928
Int. Cl.³ C07C 45/50
U.S. Cl. 568—454 14 Claims

1. A continuous process for the production of a non-linear aldehyde by hydroformylation of an internal olefin feedstock selected from the group consisting of internal olefins and substituted internal olefins which comprises:

providing a hydroformylation zone containing a charge of a liquid reaction medium having dissolved therein a complex rhodium hydroformylation catalyst comprising rhodium in complex combination with carbon monoxide and with a cyclic phosphite having a bridgehead phosphorus atom linked to three oxygen atoms at least two of which form together with the bridgehead phosphorus atom part of a ring;

continuously supplying said internal olefin feedstock to the hydroformylation zone;

maintaining in the hydroformylation zone a temperature in the range of from about 40° C. to about 160° C. and a pressure in the range of from about 4 bar to about 75 bar;

supplying make-up hydrogen and carbon monoxide to the hydroformylation zone; and

recovering from the liquid hydroformylation medium a hydroformylation product comprising at least one non-linear aldehyde.

4,482,750

PROCESS FOR REMOVING ALKALINE CATALYSTS FROM POLYETHER POLYOLS

Hartmut Hetzel, Cologne; Pramod Gupta, Bedburg; Roland Nast, Dormagen; Herbert Echterhof, Erkelenz, and Ulrich Brocker, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 251,432, Apr. 6, 1981, abandoned. This application Dec. 22, 1982, Ser. No. 452,178

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016113

Int. Cl.³ C07C *41/34*

U.S. Cl. 568—621 **9 Claims**

1. A process for removing alkali material from a polyether polyol produced by base-catalyzed polyaddition of an alkylene oxide, comprising:

(a) adding from 1 to 20 percent by weight of water and from 0 to 30 percent by weight of an inert, organic solvent to the alkaline polyether polyol to form an emulsion;

(b) maintaining the thus-formed emulsion at a temperature of at least 70° C. for at least 30 minutes with little or no stirring to destabilize the emulsion and thereby promote separation of the emulsion into an organic and an aqueous phase;

(c) separating the aqueous phase from the organic phase by passing the emulsion through a sheet-formed structure made of fine fibers, which sheet structure has a weight per unit area of from 100 to 10,000 g/m² and a thickness of from 1 to 100 mm; and

(d) removing residual alkaline material from the organic phase.

4,482,751

METHOD FOR PREPARATION OF 8-METHOXY-4,8-DIMETHYL-1-(4-ISOPROPYL-PHENYL)-NONANE

Kambiz Javdani, Walnut Creek, and William J. Welch, Benicia, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 14, 1983, Ser. No. 465,943

Int. Cl.³ C07C *41/18*

U.S. Cl. 568—626 **13 Claims**

1. A process for the preparation of 8-methoxy-4,8-dimethyl-1-(4-isopropylphenyl)-nonene which comprises the steps of

(a) reacting para-isopropylbenzyl chloride with triphenylphosphine in the presence of a methanol solvent for sufficient period of time and at a sufficient temperature to form an intermediate product in solution with methanol, para-isopropylbenzyl triphenylphosphonium chloride, and

(b) reacting said methanol solution with sodium methoxide, followed by methoxycitronellal to produce 8-methoxy-4,8-dimethyl-1-(4-isopropylphenyl)-1-nonene, and

(c) separating said intermediate product from the residual reactants.

6. A process for the preparation of 8-methoxy-4,8-dimethyl-1-(4-isopropylphenyl)-nonane which comprises the steps of:

(a) reacting para-isopropylbenzyl chloride with triphenylphosphine in the presence of a suitable solvent at a temperature of and for a sufficient period of time to form a slurry of para-isopropylbenzyl triphenylphosphonium cloride in the solvent,

(b) extracting the solids thus formed with methanol for a period of time sufficient to achieve phase separation between the solvent and methanol in which the para-isopropylbenzyl triphenylphosphoniuim chloride is then taken up in the methanol,

(c) reacting said para-isopropylbenzyl triphenylphosphonium chloride solution with sodiuim methoxide, followed by methoxycitronellal at a temperature of and for a sufficient period of time to produce cis- and trans-8-methoxy-4,8-dimethyl-1-(4-isopropylphenyl)-1-nonene, and

(d) hydrogenating said cis- and trans-8-methoxy-4,8-dimethyl-1-(4-isopropylphenyl)-1-none in the presence of a suitable solvent and a palladium carbon catalyst at a temperature of and for a sufficient period of time to produce the end product, 8-methoxy-4,8-dimethyl-1-(4-isopropylphenyl)-nonane.

4,482,752

ORGANIC COMPOUND CONVERSION

Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 105,324, Dec. 19, 1979, abandoned, which is a division of Ser. No. 973,658, Dec. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 819,026, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,883, Apr. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 443,583, Feb. 9, 1974, Pat. No. 3,980,583. This application Dec. 29, 1982, Ser. No. 454,301 The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.³ C07C *5/24*

U.S. Cl. 585—670 **13 Claims**

1. A method for organic compound conversion involving double bond isomerization which comprises contacting an organic compound under conditions effective for double bond isomerization with a catalyst comprised of a substrate of a porous refractory oxide, said substrate having surface hydroxyl groups, a minimum surface area of about 10 m²/g and pores with a minimum pore diameter of about 5 Angstrom Units, said substrate being modified by at least one amine functional member, containing the element silicon, coordinated to a metal function of a transition metal selected from the group consisting of Group VIII metals of the Periodic Table of Elements and mixtures thereof, said amine functional member acting as a bridging member between said substrate and said metal function, as a ligand covalently bonded to said substrate.

4,482,753

CATALYST FOR USE IN THE HYDROGENOLYSIS OF METHYL GLYCOL FORMALS

Tai-Nang Huang, and Carlos G. Fernandez, both of Guilford, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 28, 1983, Ser. No. 479,299

Int. Cl.³ C07C *41/01, 41/28*

U.S. Cl. 568—678 **12 Claims**

1. In the process for preparing glycol alkyl ethers from the corresponding glycol formals by hydrogenolysis in the presence of a catalyst, the improvement which comprises employing as said catalyst a hydrogenolysis catalyst comprised of alumina granules having a porous catalytic surface, said surface being impregnated with a mixture comprised of nickel and ruthenium wherein the weight of said mixture ranges from between about 5.5 to about 30 percent of the weight of said alumina granules, and wherein the proportion of catalyst is between about 5 and about 35 percent by weight of the liquid content present in the reactor.

4,482,754

OXIDATION OF BIPHENOLS

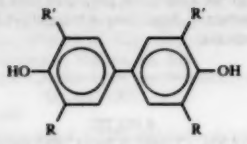
Robert M. Strom, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 7, 1983, Ser. No. 464,445

Int. Cl.³ C07C *39/14, 37/00*

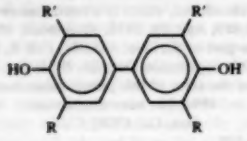
U.S. Cl. 568—730 **13 Claims**

1. A continuous process for preparing a substituted 4,4'-biphenol corresponding to the formula:

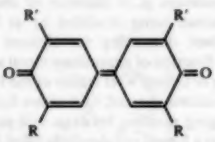


wherein R is hydrogen or R′ and R′ is independently each occurrence a lower alkyl group comprising:

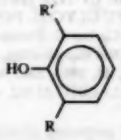
(1) contacting a substituted 4,4′-biphenol corresponding to the formula:



with oxygen at a temperature from about 30° C. to about 300° C. and a pressure from about atmospheric to about 1000 psig in the presence of a catalytic amount of an oxidation catalyst to thereby prepare a substituted 4,4′-diphenoquinone corresponding to the formula:



(2) reducing the substituted 4,4′-diphenoquinone by contacting with a substituted phenol corresponding to the formula:



to thereby produce the substituted biphenol;

(3) recovering a portion of the substituted biphenol product; and

(4) recycling the remaining portion of the substituted biphenol product to step (1).

4,482,755

HIGH YIELD PROCESS FOR PREPARING 4,4′-BIPHENOL AND PARA-ALKYLBENZENES

Walter M. Kruse, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Jul. 15, 1983, Ser. No. 514,253
Int. Cl.³ C07C *39/15*
U.S. Cl. 568—730 **11 Claims**

1. An improved process for making 4,4′-biphenol and an R-substituted alkylbenzene which comprises the steps of:

(a) forming a tetralkyl 4,4′-biphenol by the hydrogenation of a diphenoquinone having the general formula:

wherein R is a tertiary alkyl group having 4–8 carbon atoms employing hydrogen gas at pressures ranging from atmospheric to 100 psi and 0.1–10% by weight of a heterogeneous catalyst selected from noble and transition metals in a solvent solution of an alkyl benzene at temperatures ranging from 5°–10° C. below the boiling point of said solvent,

(b) removing said catalyst from the tetraalkyl biphenol containing solution,

(c) heating said solution at temperatures ranging from 100°–200° C. at pressures ranging from atmospheric to 100 psi in the presence of a strong Lewis acid catalyst in an inert atmosphere to form 4,4′-biphenol and an R-substituted alkylbenzene derivative, and

(d) recovering 4,4′-biphenol and said R-substituted alkylbenzene from said solution.

4,482,756

PRODUCTION OF HYDROQUINONES

Chao-Yang Hsu, Media, and James E. Lyons, Wallingford, both of Pa., assignors to Sun Tech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 372,874, Apr. 29, 1982, abandoned. This application Jul. 5, 1983, Ser. No. 511,111
Int. Cl.³ C07C *39/08, 37/00*
U.S. Cl. 568—772 **19 Claims**

1. A process for making a hydroquinone compound from phenol or a substituted phenol in a homogeneous liquid phase reaction, comprising (a) contacting said phenol or substituted phenol with oxygen at elevated pressure in the presence of a copper catalyst to form the corresponding p-benzoquinone, (b) removing unreacted oxygen, and (c) in the same reaction mass without additional catalyst or separation of the p-benzoquinone compound, contacting the p-benzoquinone compound with hydrogen at elevated temperature and pressure to form said hydroquinone compound.

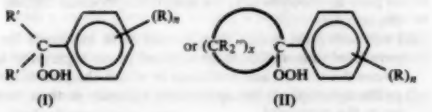
4,482,757

CLEAVAGE OF HYDROPEROXIDES

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 24, 1983, Ser. No. 507,399
Int. Cl.³ C07C *37/08*
U.S. Cl. 568—798 **10 Claims**

1. A process for the formation of ketones and phenols by the cleavage of a secondary alkyl substituted benzene hydroperoxide of the formula:



(I) (II)

wherein R is a C_1–C_{20} alkyl, cycloalkyl, or alkaryl radical, R′ is independently a C_1 to C_{10} alkyl, aryl, or alkaryl radical, R″ is independently H or a C_1 to C_{10} alkyl, aryl, or alkaryl radical, n is an integer from 0–5, and x is an integer from 2 to 11;

comprising contacting said hydroperoxide with a mixture consisting essentially of (a) about 0.1–5 wt % based on the weight of said secondary-alkyl substituted benzene hydroperoxide of an organic phosphonium halide compound of

the general formula R'''_4PX wherein R''' represents a C_1 to C_{20} alkyl, aryl, alkaryl, or aralkyl radical and X is a halogen and (b) about 0.1–10 wt % based on said hydroperoxide of at least one acid selected from the group consisting of a mineral acid and a carboxylic acid of the formula $R^{IV}COOH$ wherein R^{IV} is a C_1 to C_5 alkyl group at a temperature of from about 0°–200° C.

4,482,758

PROCESS FOR THE ORTHOMETHYLATION OF PHENOLIC COMPOUNDS

Reinhard Seig, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,294

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149022

Int. Cl.³ C07C *37/16*

U.S. Cl. 568—804 **14 Claims**

1. A process for the orthomethylation of a phenolic compound having at least one hydrogen atom in an ortho position, comprising reacting the phenolic compound with methanol, in the gaseous phase, in a molar ratio of phenolic compound to methanol of from 1:1 to 1:10, at a temperature of 270°–450° C., under a pressure of 1–40 bar absolute, at a flow rate per unit volume (LHSV) of 0.05–3 h^{-1}, using a catalytically effective amount of a metallic oxide catalyst comprising a calcined mixture of the oxides of iron, chromium, and cerium in an atomic ratio of Fe:Cr:Ce of 1:0.005 to 0.1:0.005 to 0.1, and maintaining said reaction temperature substantially constant within a temperature range of up to 20° C., to produce o-cresol, 2,6-dimethylphenol, 2,3- or 2,4-dimethylphenol and/or 2,3,6- or 2,4,6-trimethylphenol.

4,482,759

FUNGICIDALLY ACTIVE BENZHYDROL DERIVATIVES

Werner Schwarze, Frankfurt, and Axel Kleemann, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

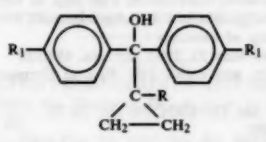
Filed Feb. 22, 1983, Ser. No. 468,593

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206225

Int. Cl.³ C07C *33/34*

U.S. Cl. 568—809 **15 Claims**

1. A benzhydrol derivative of formula (I)



(I)

in which R is ethyl or methyl and R_1 is halogen or hydrogen.

4,482,760

PROCESS FOR THE PRODUCTION OF 1,2-DIOLS

Axel Kleemann, Hanau; Klaus Deller, Hainburg; Karlheinz Drauz, Freigericht, and Bernd Lehmann, Constance, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

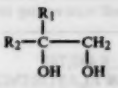
Filed Nov. 16, 1983, Ser. No. 552,106

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242749

Int. Cl.³ C07C *7/00*

U.S. Cl. 568—811 **22 Claims**

1. A process for the production of a 1,2-diol of the general formula



(I)

where each of R_1 and R_2 is hydrogen, an alkyl group of 1 to 10 carbon atoms or a 1 to 10 carbon atom alkyl group substituted by a halogen atom, a hydroxy group, a phenyl group a methoxy group, or an ethoxy group, a phenyl group or a furyl group or R_1 and R_2 together form an alkylene group having 2 to 7 carbon atoms comprising hydrogenating a cyanohydrin of the formula

(II)

in an aqueous medium which per mole of cyanohydrin of formula (II) employed contains at least 1 mole of water,

(a) in the presence of a palladium or platinum catalyst and, based on the cyanohydrin of formula (II) at least one equivalent of an inorganic or organic acid or at least one equivalent of an acid ion exchanger or in the presence of metallic nickel and, again based on the cyanohydrin of formula (II), at least one equivalent of an acid ion exchanger at a temperature between −20° and +25° C. and a hydrogen pressure of less than 10 bar until one mole of hydrogen is taken up per mole of cyanohydrin of formula (II) employed, and

(b) continuing the hydrogenation in the presence of metallic nickel at a temperature between 30° and 100° C. and a hydrogen pressure between 10 and 150 bar until the end of the absorption of hydrogen.

4,482,761

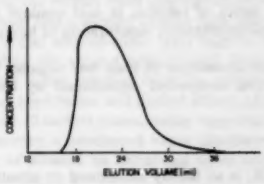
BULK SEPARATION OF INOSITOL AND SORBITOL BY SELECTIVE ADSORPTION ON ZEOLITIC MOLECULAR SIEVES

Chien C. Chao, Millwood, and John D. Sherman, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 417,577, Sep. 13, 1982, abandoned. This application Jan. 12, 1983, Ser. No. 457,427

Int. Cl.³ C07C *35/16, 31/26, 27/76*; C13D *3/12*

U.S. Cl. 568—833 **9 Claims**



1. A process for the separation of inositol from a solution of a carbohydrate mixture containing inositol and at least one other carbohydrate which comprises contacting said mixture at a pressure sufficient to maintain the system in the liquid phase with an adsorbent composition comprising at least one crystalline aluminosilicate zeolite selected from the group consisting of zeolite type X and zeolite type Y in which the zeolite cations in association with at least about 50% of the AlO_4 tetrahedra of said aluminosilicate are selected from the group consisting of sodium and barium whereby inositol is selectively adsorbed thereon, removing the non-adsorbed portion of said mixture from contact with the zeolite adsorbent

and desorbing inositol therefrom by contacting said adsorbent with a desorbing agent and recovering the desorbed inositol.

4,482,762

ODORANT AND/OR FLAVORING SUBSTANCES

Roman Kaiser, Uster, and Dietmar Lamparsky, Wangen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

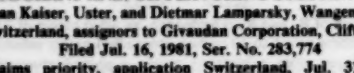
Filed Jul. 16, 1981, Ser. No. 283,774

Claims priority, application Switzerland, Jul. 31, 1980, 5839/80; Jun. 17, 1981, 3996/81

Int. Cl.³ C07C *33/03*

U.S. Cl. 368—840 7 Claims

1. A compound of the formula



I

wherein:

(i) one of the symbols R^1,R^2 and R^3 stands for methyl or ethyl and the others stand for hydrogen, and

(ii) R^4 signifies hydrogen or methyl, with the proviso that R^4 represents hydrogen when R^1 and R^2 both represent hydrogen and R^3 represents methyl.

4,482,763

PROCESS FOR HYDROXYLATING OLEFINS IN THE PRESENCE OF AN OSMIUM CONTAINING CATALYST AND ORGANIC HALOGENATED HYDROCARBON CO-CATALYST

Richard G. Austin, Ridgewood, and Robert C. Michaelson, Waldwick, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 19, 1982, Ser. No. 399,270

Int. Cl.³ C07C *29/03, 35/06, 35/14, 35/20*

U.S. Cl. 568—860 11 Claims

1. A process for hydroxylating olefins which comprises contacting in a liquid phase reaction mixture and in the presence of a catalyst composition: at least one olefin having at least one ethylenic unsaturation, at least one organohydroperoxide oxidant, water, and at least one inert organic solvent selected from the group consisting of aliphatic alcohol, aromatic alcohol, aliphatic ketone, aromatic ketone, aliphatic ether, alicyclic ether, glycol, n,n-dialkylamide, nitrile, aliphatic sulfoxide, aromatic sulfoxide, aliphatic sulfone, aromatic sulfone, and mixtures thereof, said catalyst composition comprising:

(a) as a catalyst at least one unsupported osmium containing compound capable of catalyzing the hydroxylation of said olefin in an amount of from about 1×10^{-1} to about 1×10^{-8} moles of osmium in said osmium catalyst per mole of olefin ethylenic unsaturation to be hydroxylated; and

(b) as a first co-catalyst at least one organic halogenated hydrocarbon compound represented by the structural formula:

$$R_1—X)_{n''}$$

wherein R_1 is an inertly substituted or unsubstituted hydrocarbyl group selected from the group constituting of alkyl of from about 1 to about 20 carbons, aryl of from about 6 to about 14 carbons, aralkyl and alkaryl wherein the alkyl and aryl portions thereof are as described above, and cycloalkyl of from about 4 to about 20 carbons; said R_1 substituent when present being selected from the group consisting of hydroxy, ether, and ester; X represents at least one halogen independently selected from the group consisting of F, Cl, Br, and I; and n'' is a number of from about 1 to about 10, in an amount effective to improve at least one of the rate and selectivity to hydroxylated olefin relative to the rate and selectivity in the absence of said first co-catalyst, said amount being sufficient to provide, in said reaction mixture, a ratio of moles of halide in said first co-catalyst to moles of osmium in said catalyst of from about 0.1 to about 500:1; said contacting being conducted in a manner and under conditions sufficient to hydroxylate at least one of said ethylenic unsaturation to its corresponding diol in the presence of such catalyst composition.

4,482,764

PREPARATION OF DIOLS

Guenter Herrmann, Neustadt; Elmar Frommer, Ludwigshafen; Juergen Paetsch, Wachenheim; Wolfgang Reiss, Ludwigshafen, and Siegfried Winderl, Heidelberg-Wieblingen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 203,448

Int. Cl.³ C07C *29/136, 31/16*

U.S. Cl. 568—864 6 Claims

1. A process for preparing α,ω-diols of not more than 6 carbon atoms by hydrogenating in a reactor a mixture of corresponding monocarboxylic and dicarboxylic acids, as obtained as by-products of the oxidation of cyclohexane to cyclohexanone, wherein an effective amount sufficient to prevent deposit of residues in the reactor or in heat exchangers associated with the reactor of phosphoric acid itself or of a phosphoric acid ester, said effective amount being within the range of from 1 to 1000 ppm, is added to the monocarboxylic and dicarboxylic acids or their mixtures before the hydrogenation.

4,482,765

PREPARATION OF HYDROXYCITRONELLOL

Mark S. Pavlin, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jun. 24, 1983, Ser. No. 507,475

Int. Cl.³ C07C *29/04, 31/20*

U.S. Cl. 568—875 1 Claim

1. A method of preparing hydroxycitronellol, which comprises; heating a mixture of water and citronellol to a temperature of from 40° C. to 120° C. in the presence of an inert solvent which is acetone, and a proportion of an acidic cation exchange resin.

4,482,766

PRODUCTION OF FATTY ALCOHOL WITH RECOVERY THEREOF FROM THE HYDROGENATION CATALYST

Hans-Martin Stönner, Schwalbach, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,328

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221307

Int. Cl.³ C07C *29/136, 29/76*

U.S. Cl. 568—885 10 Claims

1. In a process for the production of a fatty alcohol by catalytic hydrogenation of a feed of fatty acid or fatty acid ester, in a synthesis reactor comprising a high pressure chamber communicating with a return pipe at a temperature of 240° to 330° C. under a pressure of 200 to 700 bar in the presence of a copper chromium oxide containing a catalyst, said catalyst having a particle size of 1 to 500 microns, hydrogen, said feed and said catalyst being fed to said chamber, the contents of said chamber being thoroughly mixed and the hydrogenation being carried out in the presence of material which has already been hydrogenated, surplus hydrogen being withdrawn and recycled to said chamber, the improvement which comprises:

A. withdrawing from said synthesis reactor

(i) a first product stream containing catalyst,

(ii) a dispersion containing catalyst and product, and

(iii) reaction water containing product;

B. treating said first product stream in a first filter and sepa-

rating product until said first filter, containing a filter cake, is due for cleaning,

C. treating said dispersion is a solid-liquid-separator, from said separator withdrawing

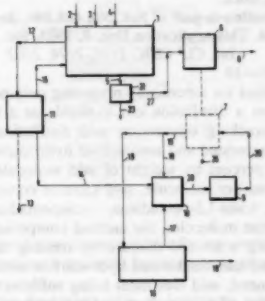
(i) catalyst,

(ii) a second product stream, and

(iii) a first mixture, said first mixture containing product and fine catalyst particles with sizes in the range of about 1 to 10 microns,

D. recycling said second product stream to the reactor,

E. after said first filter is due for cleaning and removing it from service and replacing it with an alternating second filter, treating said first filter, when removed, with a cleaning liquor which is a non-solidifying, organic solvent boiling in the range of 70° to 220° C.;



F. withdrawing a second liquid containing cleaning liquor from said removed first filter, feeding a portion of said second liquor containing cleaning liquor to a stirring vessel and at least a portion of the balance of said second liquor containing cleaning liquor to a distillation zone;

G. from said distillation zone separately withdrawing product and a stream of cleaning liquor, feeding said stream of cleaning liquor into said stirring vessel, also feeding into said stirring vessel said first mixture from said solid-liquid separator;

H. from said stirring vessel, withdrawing a second mixture and while at a temperature of 60° to 90° C. feeding it as said first liquid into said first filter when withdrawn from service, removing catalyst from said removed first filter and alternating said first filter with said second filter whereby to maintain one in filtering position while the other is removed from service and being cleaned.

4,482,767

PROCESS FOR PRODUCTION OF ALCOHOLS AND LPG

Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 20, 1983, Ser. No. 563,439

Int. Cl.³ C07C *29/04*

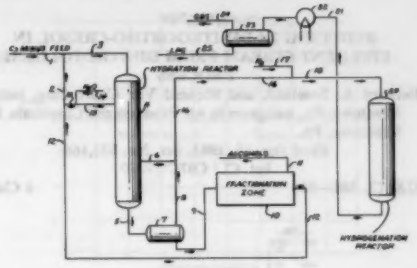
U.S. Cl. 568—899 **13 Claims**

1. A process for the production of lower alcohols which comprises the steps of:

(a) passing a feed gas stream which comprises methane, ethane, ethylene, propane, and propylene into a hydration zone operated at conditions effective to convert a portion of the entering olefins to alcohols and thereby producing a hydration zone effluent stream which comprises methane, ethane, ethylene, propane, propylene, ethanol, and propanol;

(b) separating an alcohol product stream comprising ethanol and propanol from the hydration zone effluent stream and thereby forming a process stream which comprises methane, ethane, ethylene, propane, and propylene;

(c) passing the process stream through a hydrogenation zone operated at conditions effective to saturate ethylene and propylene and producing a hydrogenation zone effluent stream; and,



(d) recovering an LPG product stream comprising propane from the hydrogenation zone effluent stream.

4,482,768

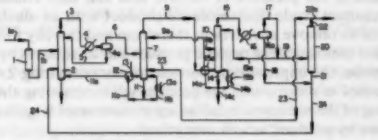
SEPARATION OF ALKANOLS FROM AQUEOUS REACTION SOLUTIONS

George S. Somekh, New Rochelle, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1983, Ser. No. 480,702

Int. Cl.³ C07C *29/80, 29/86, 29/76*

U.S. Cl. 568—918 **14 Claims**



1. Process for separating C_2 to C_4 alkanols from an aqueous reaction solution containing low-boiling and high-boiling oils which comprises:

(A) Contacting said aqueous solution with activated carbon whereby the high-boiling oils are removed;

(B) Extracting the aqueous solution from (A) at about 75°–250° C. with at least one high boiling organic solvent selected from the group consisting of paraffins, napthenes, alkylated arenes, dialkylethers and aliphatic alcohols all having 12 to 25 carbons;

(C) Cooling the extract from step (B) whereby an alkanol-water layer and a second extract layer are obtained and recycling said alkanol-water layer back to step (B);

(D) Distilling the second extract layer from (C) with an entraining agent selected from the group consisting of paraffins, naphthenes and dialkyl ethers, all having about 4 to about 12 carbon atoms, under superatmospheric pressure whereby a condensed vapor distillate comprising a mixture of alkanol, an entraining agent and water is obtained;

(E) Distilling the distillate of (D) under atmospheric pressure, employing the vapor in step (D) as a heat source into a purified alkanol bottoms product and a second distillate comprising a water-alkanol layer and an entraining agent layer;

(F) Returning part of the entraining agent from (E) to the distillation system of (E) and water washing the rest of the entraining agent to obtain:

(i) a stream of entraining agent substantially free of alkanol, and

(ii) an aqueous alkanol solution;

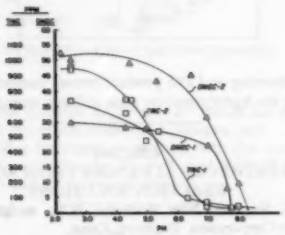
and

(G) Recycling the aqueous alkanol solution from steps (E) and (F) to the extracting step (B).

4,482,769
REDUCING 2,4-DINITROORTHO-CRESOL IN EFFLUENT STREAM FROM DINITROTOLUENE PROCESS

Bernard A. Toseland, and Richard Van Court Carr, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 16, 1983, Ser. No. 533,166
Int. Cl.³ C07C 79/10
U.S. Cl. 568—934 6 Claims



1. In a process for preparing a purified dinitrotoluene product which comprises the steps of reacting toluene with nitric acid in the presence of sulfuric acid and then contacting the resultant crude dinitrotoluene product with an alkaline material to remove nitrocresols therefrom and thereby form a purified dinitrotoluene organic product and an aqueous by-product phase, the improvement for selectively permitting 2,4-dinitrocresol to remain with the product while removing the remainder of the nitrocresols including trinitrocresol is with the aqueous by-product, which comprises:

contacting the crude dinitrotoluene formed by the reaction of toluene with nitric acid with an alkaline material;

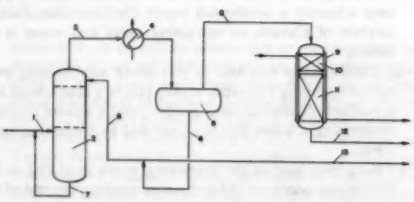
monitoring the contacting step with a pH-sensitive instrument;

terminating the introduction of alkaline material in the contacting step of said dinitrotoluene when the pH is within a range of from 5.8 to 6.4 and then separating the dinitrotoluene organic phase from the aqueous by product phase.

4,482,770
REMOVAL OF ACETYLENE FROM PRODUCTS OF 1,2-DICHLOROETHANE PYROLYSIS

Ludwig Schmidhammer, Haiming/Marktl, and Rudolf Strasser, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 6, 1981, Ser. No. 241,281
Int. Cl.³ C07C 17/38
U.S. Cl. 570—219 7 Claims



1. In a process for the removal of acetylene from the products of thermal pyrolysis of 1,2-dichloroethane, in which the pyrolysis products are separated into a liquid and a gaseous stream, and the gaseous stream is contacted with the hydrochlorination catalyst whereby the acetylene contained therein is converted to vinyl chloride, the improvement comprising contacting the gaseous stream, prior to contacting it with the hydrochlorination catalyst, with a catalyst comprising a noble metal or compound thereof, at a temperature of from about 50 to about 200° C., and a pressure from about 8 to about 20 bar absolute.

4,482,771
ANIONIC POLYMERIZATION OF CIS- AND TRANS-1,3-PENTADIENE FROM A MIXTURE OF SATURATED AND UNSATURATED HYDROCARBONS

John W. Bozzelli; Kent S. Dennis, and Felipe A. Donate, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 455,146, Jan. 3, 1983, abandoned. This application Dec. 8, 1983, Ser. No. 559,525
Int. Cl.³ C07C 1/16, 2/74, 2/02
U.S. Cl. 585—10 35 Claims

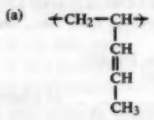
1. A method for anionically preparing polymers of 1,3-pentadiene from a distillation cut available as a by-product of crude oil cracking operations, said distillation cut being a mixture of saturated and unsaturated hydrocarbon molecules, at least 50 percent by weight of said molecules having five carbon atoms per molecule, said mixture comprising cis-1,3-pentadiene, trans-1,3-pentadiene, cyclopentadiene and other 5-carbon atom molecules, the method comprising:

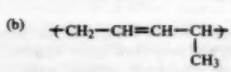
(a) forming a treated mixture by treating the mixture of saturated and unsaturated hydrocarbon molecules with an alkali metal, said treatment being sufficient to inactivate generally all (1) cyclopentadiene monomer, (2) active hydrogen compounds and (3) other compounds having a chain terminating functionality which are present in the mixture;

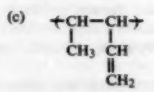
(b) separating the inactivated monomer, inactivated active hydrogen compounds, other inactivated compounds and alkali metal from the treated mixture to yield a treated polymerization feedstream;

(c) initiating polymerization of the cis- and trans-1,3-pentadiene contained in the treated polymerization feedstream by contacting, in an inert atmosphere, said treated polymerization feedstream with an initiator combination, said initiator combination comprising an organic polar solvent in conjunction with an anionic polymerization inhibitor, the anionic polymerization initiator being selected from the group consisting of (1) alkali metals, (2) dispersions of an alkali metal in an aliphatic hydrocarbon, (3) organo-alkali metal compounds.

32. A polymer of 1,3-pentadiene, said polymer having polymerized therein three constitutional repeating units:

(a)  1-2 constitutional repeating unit;

(b)  1-4 constitutional repeating unit; and

(c)  3-4 constitutional repeating unit,

said constitutional repeating units being present in amounts based on total amount of constitutional repeating units as follows

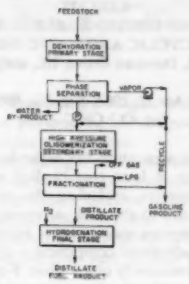
(a) from about 40 to about 56 percent,

(b) from about 6 to about 14 percent, and
(c) from about 37 to about 47 percent.

4,482,772
MULTISTAGE PROCESS FOR CONVERTING OXYGENATES TO HYDROCARBONS

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,377
Int. Cl.³ C07C 5/00, 1/00
U.S. Cl. 585—254 **16 Claims**



1. An integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons comprising the steps of

(a) contacting feedstock with at least one primary stage dehydration catalyst comprising ZSM-5 type catalyst at elevated temperature and moderate pressure to convert at least a portion of the feedstock to hydrocarbons containing a major fraction of C_2–C_4 olefins and a minor fraction containing C_5+ heavy hydrocarbons;

(b) cooling and separating dehydration effluent from step (a) to provide an aqueous liquid stream, a heavy hydrocarbon liquid stream and a light hydrocarbon vapor stream rich in C_2–C_4 olefins;

(c) pressurizing and heating at least a portion of the olefinic light hydrocarbon stream and substantially all of the heavy hydrocarbon liquid stream to form a secondary stage olefinic feedstream;

(d) contacting the olefinic feedstream in a secondary stage with oligomerization catalyst comprising medium-pore shape selective acidic zeolite at substantially increased pressure and moderate temperature to convert olefins to a heavier liquid hydrocarbon effluent stream comprising olefinic gasoline and distillate range liquids;

(e) fractionating the liquid hydrocarbon effluent stream from step (d) to obtain a distillate stream, olefinic gasoline stream and lighter hydrocarbon stream;

(f) recycling at least a portion of the olefinic gasoline stream to step (d); and

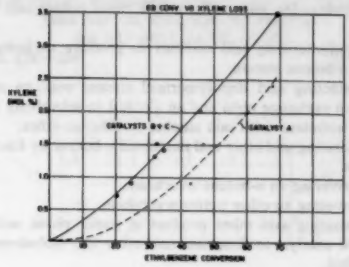
(g) hydrogenating olefinic distillate to provide a stabilized distillate product.

4,482,773
CATALYST FOR XYLENE ISOMERIZATION

Yung F. Chu, Cherry Hill, N.J.; Fritz A. Smith, Rye, N.Y., and Arthur W. Chester, Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 352,415, Feb. 25, 1982, abandoned. This application Jul. 22, 1983, Ser. No. 516,080
Int. Cl.³ C07C 5/24, 5/30
U.S. Cl. 585—481 **7 Claims**

1. A process for isomerizing an isomerization feed containing an aromatic C_8 mixture of ethylbenzene and xylene in which the para-xylene content is less than equilibrium which comprises contacting said feed, under conversion conditions with a catalyst comprising crystalline aluminosilicate zeolite ZSM-5 predominantly in the hydrogen form and having a



crystal size of at least about 1 micron, said zeolite containing platinum and a Group IIA component.

4,482,774
HYDROCARBON CONVERSION PROCESS WITH A COMPOSITE ZEOLITE

Wicher T. Koetsier, Mijnsheerenland, Netherlands, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

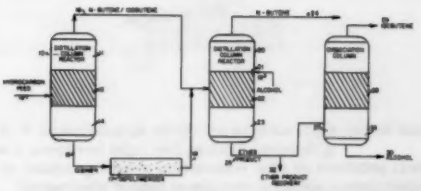
Division of Ser. No. 327,175, Dec. 4, 1981,. This application Nov. 21, 1983, Ser. No. 554,007
Claims priority, application United Kingdom, Dec. 12, 1981, 8039997
Int. Cl.³ C07C 5/22
U.S. Cl. 585—481 **18 Claims**

1. A hydrocarbon conversion process comprising contacting, under hydrocarbon conversion conditions, a hydrocarbon feed with a catalyst comprising a crystalline modified-silica zeolite having a constraint index of from 1 to 12 overlying a silica core having substantially the same crystalline structure as the modified-silica zeolite.

4,482,775
ISOMERIZATION OF C_4 ALKENES

Lawrence A. Smith, Jr., Houston, Tex., assignor to Chemical Research & Licensing Company, Houston, Tex.

Filed Sep. 22, 1982, Ser. No. 421,588
Int. Cl.³ C07C 5/24, 7/04
U.S. Cl. 585—671 **6 Claims**



1. A method for producing high purity isobutene comprising:

(a) feeding a hydrocarbon stream wherein the predominant reactive hydrocarbon comprises at least 80 weight percent n-butene to a distillation column reactor containing a fixed bed acidic cation exchange resin packing,

(b) concurrently in said distillation column reactor:

(1) contacting said n-butene with said fixed bed to isomerize a portion thereof to form a mixture of isobutene and n-butene,

(2) reacting a portion of said normal butene with a portion of said isobutene to form codimer, and

(3) fractionating the resulting mixture at a reflux ratio of 0.5 to 20:1,
(c) withdrawing an overhead containing isobutene and n-butene at a point above said fixed bed,
(d) withdrawing said codimer at a point below said fixed bed,
(e) depolymerizing said codimer to produce an isobutene and n-butene stream,
(f) contacting said depolymerized stream with an acidic cation exchange resin and an alcohol to selectively react said isobutene with said alcohol to form an ether,
(g) separating said ether and unreacted n-butene by fractionation,
(h) recovering an n-butene overhead,
(i) recovering an ether bottoms product,
(j) contacting said ether product in vapor phase with an acidic catalyst to dissociate said ether into isobutene and alcohol,
(k) separating said alcohol and said isobutene and
(l) recovering said isobutene.

4,482,776

SEPARATION OF ORTHO AROMATIC ISOMERS BY SELECTIVE ADSORPTION WITH AN ALUMINOPHOSPHATE

Daniel D. Rosenfeld, Houston, Tex., and Denise M. Barthomeuf, Cranford, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 27, 1983, Ser. No. 507,761
Int. Cl.³ C07C 7/13
U.S. Cl. 585—828 **14 Claims**

1. An adsorptive separation process for separating the ortho aromatic isomers from a hydrocarbon feed stream containing a mixture of aromatics comprising:
(a) contacting said hydrocarbon feed stream with a bed of a crystalline aluminophosphate adsorbent $AlPO_4$-5;
(b) withdrawing from said bed of adsorbent a raffinate stream containing less of the selectively adsorbed ortho aromatic isomer of the feed stream;
(c) desorbing the adsorbed ortho aromatic isomer to effect displacement thereof and withdrawing from the adsorbent bed an extract stream containing the ortho aromatic isomer.

4,482,777

SEPARATION OF ORTHO BI-ALKYL SUBSTITUTED MONOCYCLIC AROMATIC ISOMERS

Richard W. Neuzil, Downers Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 2, 1984, Ser. No. 596,212
Int. Cl.³ C07C 7/12
U.S. Cl. 585—828 **16 Claims**

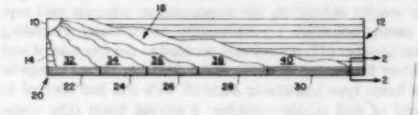
1. A process for separating the ortho-isomer from a feed mixture comprising at least two bi-alkyl substituted monocyclic aromatic isomers, including the ortho-isomers, said isomers having from 9 to about 18 carbon atoms per molecule, which process comprises contacting, at adsorption conditions, said feed with an adsorbent comprising a crystalline aluminosilicate consisting essentially of a sodium Y-type zeolite which selectively adsorbs said ortho-isomer, removing said feed from said adsorbent, and recovering said ortho-isomer by desorption at desorption conditions with a desorbent material comprising a C_8 or heavier monocyclic aromatic, said feed mixture and said desorbent material having boiling points of at least 5° C. difference.

4,482,778

SOLAR ENERGY CONVERTER USING SURFACE PLASMA WAVES

Lynn M. Anderson, Lyndhurst, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 19, 1983, Ser. No. 486,470
Int. Cl.³ H01L 31/06
U.S. Cl. 136—246 20 Claims



1. Apparatus for converting sunlight to electricity by extracting energy from photons therein comprising

an electrically conducting member,

means for dispersing sunlight over a surface of said member to polarize the surface charge thereon thereby inducing oscillations in the valence electron density at said surface to produce surface plasmons and for phase-matching photons and surface plasmons of the same energy so that energy is transferred from said photons to said plasmons, and

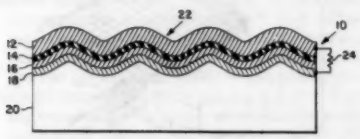
means for extracting energy from said surface plasmons and converting the same to electricity.

4,482,779

INELASTIC TUNNEL DIODES

Lynn M. Anderson, Lyndhurst, Ohio, assignor to The United States of America as represented by the Administrator of National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 19, 1983, Ser. No. 486,471
Int. Cl.³ H01L 31/06
U.S. Cl. 136—255 18 Claims



1. Apparatus for using plasmons to convert electromagnetic energy to electrical power comprising

a first conductive film having one surface adapted for receiving incident electromagnetic energy and an opposite surface adapted to face away from said electromagnetic energy, said first conductive film having a configuration of a diffraction grating,

an insulating film having said diffraction grating configuration covering said opposite surface of said first electrically conducting film,

a semiconductor film having said diffraction grating configuration covering said insulating film, said diffraction grating configuration having a predetermined period which causes a mode conversion into junction plasmons with fields localized in said semiconductor film and said insulating film by phase-matching between external electromagnetic waves and said junction plasmons,

a second conductive film having said diffraction grating configuration covering said semiconductor film thereby forming a diode, and

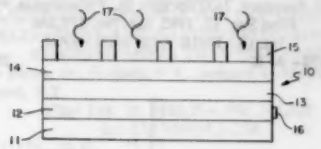
an electrical load connected between said first and second conductive films.

4,482,780

SOLAR CELLS WITH LOW COST SUBSTRATES AND PROCESS OF MAKING SAME

Kim W. Mitchell, Indian Hills, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 30, 1982, Ser. No. 445,772
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—258 15 Claims



1. A solar cell comprising a substrate,

an intermediate crystalline film deposited on the substrate and recrystallized by zone melting the crystalline film at a temperature of at least about the melting point temperature of the crystalline film to cause the film to recrystallize with a grain size not less than about 1000 microns², and

a semiconductor material capable of absorbing light deposited on said recrystallized intermediate film,

said recrystallized intermediate film having a suitable lattice match with said semiconductor material,

said semiconductor material having a grain size not less than about 10 microns², and

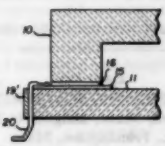
electrical contact means electrically connected to said recrystallized intermediate film and to said semiconductor material.

4,482,781

STABILIZATION OF SEMICONDUCTOR DEVICE PACKAGE LEADS

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 17, 1982, Ser. No. 379,204
Int. Cl.³ H05K 5/02
U.S. Cl. 174—52 FP 8 Claims



6. A semiconductor device package having a pair of faces and a peripheral edge, said package comprising:

an insulating base in combination with an insulating cover hermetically bonded to said base to enclose a semiconductor device, said base including an array of fired on conductive strips that span the hermetic bond between said base and said cover;

a lead array comprising a plurality of relatively thin flat package leads, each one of which has an inner end electrically and mechanically secured to one of said conductive strips;

means for adhesively bonding each of said leads over a substantial portion of its length to said peripheral edge, said bonding means comprising a layer of insulating material having an adhesive on one face thereof and located on top of said leads whereby said adhesive contacts said leads

directly and contacts said peripheral edge between said leads; and

a bent portion of said leads extending a lead securing face to a plane located beyond one of the faces of said package whereby said package can be surface mounted.

4,482,782

METHOD OF PROVIDING A SOLDERED ELECTRICAL CONNECTION AND THE ELECTRICAL CONNECTION

Howard H. Sheppard, 7430 Sprague St., Philadelphia, Pa. 19119

Filed Sep. 13, 1982, Ser. No. 417,240
Int. Cl.³ H01R *4/02, 4/20, 43/04*
U.S. Cl. 174—94 R **29 Claims**

1. An improved electrical connection of a wire to a terminal, comprising:

a ring having an inside diameter of sufficient dimension to allow said ring to fit over said terminal to which a wire is to be connected;

said wire being installed within said ring and juxtaposed along a substantial length of said terminal, said ring being compressed onto said terminal to form a mechanical connection between said terminal and said wire; and

at least said wire and said terminal being soldered together to form a soldered connection therebetween.

10. A method of making an improved electrical connection between a wire and a terminal, comprising the steps of:

providing a ring having an inside diameter of sufficient dimension to allow said ring to fit over a terminal to which a wire is to be bonded;

installing said ring over said terminal, said wire to be bonded being inserted within said ring in juxtaposition to said terminal;

compressing said ring onto said terminal and said wire to form a mechanical connection between said terminal and said wire; and

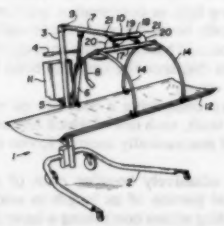
soldering at least said wire to said terminal.

4,482,783

PATIENT WEIGHING SCALE WITH HOIST

Eric Laimins, Belmont, Mass., assignor to Hottinger Baldwin Measurements, Inc., Framingham, Mass.

Filed Mar. 8, 1976, Ser. No. 664,709
Int. Cl.³ G01G *19/14, 3/14*
U.S. Cl. 177—147 **10 Claims**



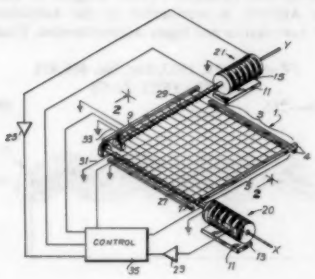
1. In a patient weighing scale having a frame structure, a cantilever boom having a free end and a secured end, means movably connecting said secured end of said cantilever boom to said frame structure, power means operatively arranged between said frame structure and said cantilever boom for raising and lowering the latter, support means for operatively securing a stretcher to said free end of said cantilever boom, transducer means operatively arranged for sensing a load applied to said support means, whereby the transducer means are responsive to a weight on a stretcher, and display means operatively connected to said transducer means for providing a direct weight indication, the improvement wherein said support means comprise a substantially horizontally extending tubular member (**17**) operatively secured to the free end of said cantilever boom, and wherein said transducer means comprise a first beam type transducer secured with one end thereof to one end of said tubular member, a second beam type transducer secured with one end thereof to the opposite end of said tubular member, each beam type transducer having a substantially horizontally extending geometrical axis and a free end extending substantially horizontally out of said tubular member, whereby a vertical force caused by said load extends substantially perpendicularly to said geometrical axis, and hoop means for connecting the respective free end of each beam type transducer to a stretcher.

4,482,784

POSITION DETERMINATION DEVICE

Albert L. Whetstone, Stratford, Conn., assignor to Summagraphics Corporation, Fairfield, Conn.

Filed Feb. 1, 1982, Ser. No. 344,874
Int. Cl.³ G08C *21/00*
U.S. Cl. 178—19 **15 Claims**



1. An automatic coordinate determining device comprising:

a tablet having a grid of parallel spaced electrical conductors;

a longitudinal magnetostrictive element with an axis transverse to said conductors;

a device movable over the surface of said tablet and including a flux producing element inductively coupled to at least one of said parallel conductors;

means for energizing said flux producing element to induce an electrical current in said one conductor, said current in turn inducing a first strain wave in said magnetostrictive element at a region adjacent said one conductor, said strain wave being propagated along the axis of said magnetostrictive element; and

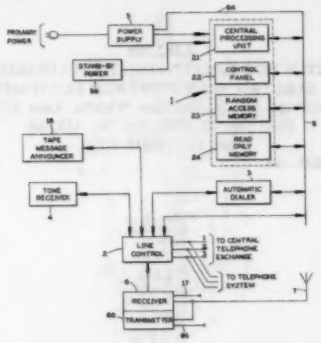
sensing means comprising a delay line for producing an output in response to said strain wave, said delay line including a plurality of serially connected inductive coils inductively coupled to said magnetostrictive element, a capacitor coupling each of said plurality of inductive coils to a common reference potential, and terminating impedance connecting the last of said plurality of inductive coils to said common ground.

4,482,785

REFRIGERATION MONITOR SYSTEM WITH REMOTE SIGNALLING OF ALARM INDICATIONS

Christopher D. Finnegan, 916 SW. 116th Way, Fort Lauderdale, Fla. 33325, and Arthur J. Geiss, 1 S. Pine Island Rd., Plantation, Fla. 33323

Filed Sep. 23, 1982, Ser. No. 421,982
Int. Cl.³ H04M 11/04
U.S. Cl. 179—5 P 10 Claims



1. A refrigeration monitor system for monitoring a freezer or compartments containing perishable products and for automatically transmitting freezer failure alarms, the system comprising:

at least one freezer group comprising a plurality of freezer compartments, each compartment containing at least one thermal sensor having an adjustable upper temperature setting;

at least one telephone line connectable through switching means to at least one remote telephone instrument of the DTMF type having a callable telephone number;

number storage means for storing at least one callable telephone number in machine memory, said number storage means communicating with line control means capable of connecting said number storage means to said telephone line and dialling said callable telephone instrument;

recorded message means for recording and on demand playing recorded messages said recorded message means communicating with said line control means for playing into said telephone line recorded messages;

tone receiver of the DTMF type for receiving tone-encoded signals and codes, communicating with said line control means for receiving signals for start of dialling and receiving manually produced answer codes of the DTMF type from said telephone instrument;

control means responsive to said temperature sensor such that upon attaining said upper temperature setting, said temperature sensor operatively activates said control means to traverse a control program stored in memory, said control program comprising a sequence of steps causing said callable telephone instrument to be dialled by said stored telephone number and to be connected to said recorded message means and to be connected to said DTMF tone receiver means for detection of a manually produced preselected answer code from said DTMF telephone insutrument, said answer code operating to cause said line control to disconnect from said telephone line;

communications means linking said freezer group with said line control having

a first radio receiver-transmitter combination in wired two-way communication with said line control means;

a second radio receiver-transmitter combination in wired two-way communication with said thermal sensors;

said first radio receiver-transmitter combination transmitting on a first frequency and receiving on a second frequency;

said second radio receiver-transmitter combination transmitting on said second frequency and receiving on said first frequency;

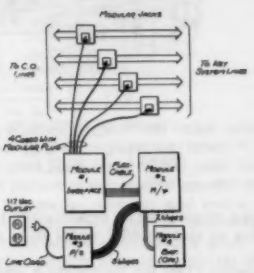
said first and second radio receiver-transmitter combinations in mutual wireless two-way communications.

4,482,786

MEMORY DIALER SYSTEM FOR USE WITH PLURAL TELEPHONES AND HAVING PROVISION FOR STACKING MORE THAN ONE USER

Arthur Flynn, Jr., Syosset, N.Y., assignor to Metro-Tel Corp., Syosset, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,325
Int. Cl.³ H04M 1/274
U.S. Cl. 179—90 B 30 Claims



1. A memory dialer system for a telephone system having a telephone line and a plurality of telephone extensions comprising microprocessing means, interface means, means for connecting the interface means with said microprocessing means and with at least one of said telephone lines, memory means in said microprocessing means for storing a predetermined number of telephone numbers, means responsive to selection means for activating the processing means to automatically dial a selected telephone number, said selection means being operable by means operatively connected to each of said telephone extensions, and means operable from each of said telephone extensions to program said memory to store additional telephone numbers for future use, said interface being connected to each extension, and means provided to delay a call unit until a line is cleared if more than two telephone numbers are simultaneously dialed.

4,482,787

TELEPHONE-CALL PROHIBIT CIRCUIT

Iwao Sagara, and Keisuke Kataoka, both of Tokyo, Japan, assignors to OKI Electric Industry Co. Ltd., Japan

Filed Jan. 4, 1983, Ser. No. 455,600
Int. Cl.³ H04M 1/66
U.S. Cl. 179—90 D 12 Claims

1. A telephone-call prohibit circuit for preventing a telephone set from being used without approval, said telephone set including a handset, telephone lines coupled to said handset, means for generating dial pulse signals, and hookswitches for coupling said telephone lines to said handset and for cooperating with said handset, said telephone-call prohibit circuit comprising:

means (24, 130) for converting said dial pulse signals into a binary code,

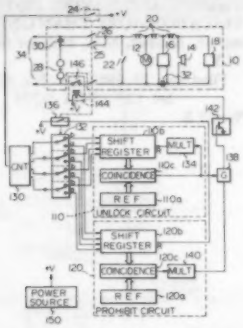
a prohibit circuit (120) for generating a prohibit signal which prohibits a telephone call when said binary codes corresponding to prohibited dial numbers are inputted thereto,

an unlock circuit (110) for generating during a predetermined period a control signal which allows a telephone

call to said prohibited dial numbers when said binary codes corresponding to secret dial numbers are inputted thereto,

a transfer switching means (132) for selectively coupling said converting means (24, 130) to either said prohibit circuit (120) or to said unlock circuit (110) and for cooperating with said hookswitches (25),

a gate circuit (138) for preventing the passing of said prohibit signal of said prohibit circuit (120) in response to said control signal of said unlock circuit (110),



a switching means (144) for breaking said telephone lines in response to said prohibit signal from said gate circuit (138),

a reset means (136) for generating a reset signal to said prohibit circuit (120) when said hookswitches are closed, whereby said prohibit circuit (120) is reset to its initial condition, and

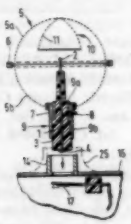
a power source (150) for supplying energy to each circuit of said telephone-call prohibit circuit.

4,482,788

TRANSDUCER FOR THE TRANSFORMATION OF ELECTRICAL MODULATIONS INTO VIBRATORY MODULATIONS

Siegfried Klein, 42 rue de la Tour d'Auvergne, Paris 75009, France

Continuation of Ser. No. 132,230, Mar. 31, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 312,635
Claims priority, application France, Apr. 13, 1979, 79 09449
Int. Cl.³ H04R *23/00*
U.S. Cl. 179—113 **17 Claims**



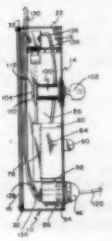
1. A transducer for the transformation of electrical modulations into acoustic vibrations, comprising a needle-shaped discharge electrode having a tip, which is embedded, except in the region of its tip, in an electrode holder made of an electrically insulating and heat-resistant material, and a hollow counter electrode surrounding said discharge electrode and having an interior and being formed of an electrically conductive material, permeable to sound waves, and including a passage in which said electrode holder is fitted and through which the latter extends into said interior, said counter electrode being perforated and being spaced from said tip of said discharge electrode so that the counter electrode forms a Faraday cage.

4,482,789

APPARATUS FOR PREVENTING UNAUTHORIZED USE OF ELECTRICALLY POWERED EQUIPMENT

Jack L. McVey, 1926 N. Sheridan, Wichita, Kans. 67203

Filed Sep. 27, 1982, Ser. No. 423,866
Int. Cl.³ H01H *9/28*
U.S. Cl. 200—44 **8 Claims**



2. In apparatus for preventing the unauthorized supply of electrical energy to an electrical power cord plug, said apparatus comprising an electrical power outlet socket adapted to receive an electrical power cord plug to be energized therefrom, plug-holding means freely movable between obstructing and non-obstructing positions and adapted in the former position to obstruct withdrawal of a power cord plug from said outlet socket, key-controlled means inclusive of a cam movable between on and off positions for respectively enabling and preventing the supply of electrical energy to the outlet socket, with said cam being respectively disposed in positions that allow and prevent movement of the plug-holding means from its obstructing position when the key-controlled means is in its on and off positions, whereby a power cord plug cannot be withdrawn from the outlet socket for energization elsewhere when the key-operated means is in its off position to prevent energization of the socket, and whereby only an authorized person can selectively turn the key-controlled means to its on position, a finger tab connected to the plug holding means for enabling movement of the latter between its obstructing and non-obstructing positions when the key-controlled means is in its on position, said cam being operative to cam the plug-holding means toward its obstructing position upon the key-controlled means being moved from its on to its off position, said security means and the plug-holding means being so constructed and arranged that the latter can be freely moved between its obstructing and non-obstructing positions when the key-controlled means is in its on position, a housing preventing access to the structure thus far recited such that would enable an unauthorized person to remove a power cord plug from the socket when the key-controlled means is in its off position, said housing having an elongated opening therethrough, with said finger tab extending through the opening to the exterior of the housing in a direction normal to the direction of movement of the plug-holding means, whereby the plug-holding means can be manually moved freely from either of its positions to the other from the exterior of the housing when the key-controlled means is in its on position.

4,482,790

VACUUM INTERRUPTER

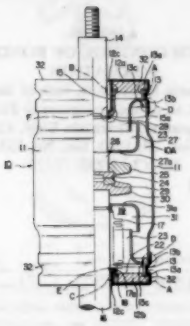
Hiroshi Miyagawa, Yokohama, and Masayuki Kano, Shizuoka, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,460

Claims priority, application Japan, Dec. 19, 1981, 56-190180[U]

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **9 Claims**



1. In a vacuum interrupter having:

(a) a vacuum envelope including a metallic casing member, an insulating means including a ceramic casing member, a stationary electric lead rod, a movable electric lead rod and a metallic bellows, each of the above parts being interconnected in a vacuum environment;

(b) a pair of separable stationary and movable electrodes having a contact junction located in the vacuum envelope;

(c) an inside end of the stationary lead rod rigidly secured to the stationary electrode and said stationary lead rod extending outwardly of the vacuum envelope;

(d) an inside end of the movable lead rod rigidly secured to the movable electrode and said movable lead rod extending outwardly of the vacuum envelope;

(e) one end of the metallic bellows secured to the movable lead rod and another end of said metallic bellows secured to an aperture in the vacuum envelope; the improvement comprising:

(f) said metallic casing member being brazed in the vacuum environment to a metallized layer provided on an unglazed insulating ceramic for said insulating casing member when in a high evacuated vacuum furnace;

(g) an impervious insulating film coated adhesively to each clean state atmospheric-side surface by means of vacuum brazing of said unglazed insulating ceramic, a connecting portion and a vicinity thereof between said unglazed insulating ceramic and said metallic casing member.

4,482,791

PUSH BUTTON SWITCH

Walter Rendgen, Calw-Hirsau, Fed. Rep. of Germany, assignor to Robert Seuffer GmbH & Co., Calw-Hirsau, Fed. Rep. of Germany

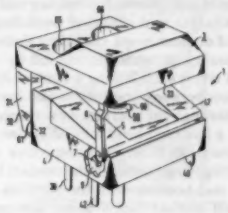
Filed Sep. 30, 1982, Ser. No. 429,155

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205389

Int. Cl.³ H01H *13/56*

U.S. Cl. 200—153 J **35 Claims**

1. A push button switch comprising: a housing; a push button movably supported on the housing; a contact rocker member mounted in the housing pivotally between first and second positions; an elongate spring having a first anchored end and a second end connected to the rocker member, the push button being operable upon actuation thereof to apply to the elongate spring a force which is applied substantially transversely to the direction of elongation of the spring, thereby to cause the rocker member to pivot into its second position, the elongate spring being adapted to apply a return force to cause the rocker member to pivot from its second position into its first position; a control member connecting the push button to the housing and comprising an engagement portion, said control member including an arm mounted on the push button, said arm carried on a spindle rotatably mounted in said push button, and wherein spring biassing means engages said spindle; and arresting means on said housing, adapted to co-operate with said engagement portion on said control member to hold said



push button in a position in which said rocker member is held in its said second position, against the return force of said elongate spring, until reactuation of said push button causes said engagement portion of said control member to disengage from said arresting means, whereby said rocker member is pivoted back into its first position by the force of said elongate spring said arresting means comprising a guide groove arrangement having a portion adapted to provide the arresting action upon engagement of said engagement portion of said control member therewith, and a spring biassing means engaging said control member to urge said engagement portion of said control member into said guide groove arrangement.

4,482,792

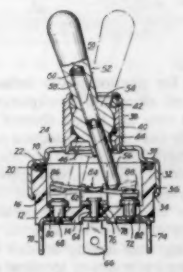
SEALED TOGGLE SWITCH

Leo Geremia, Wallingford, Conn., assignor to Tri-tech, Inc., Waterbury, Conn.

Filed Dec. 7, 1981, Ser. No. 327,804

Int. Cl.³ H01H *21/08*

U.S. Cl. 200—302.3 **4 Claims**



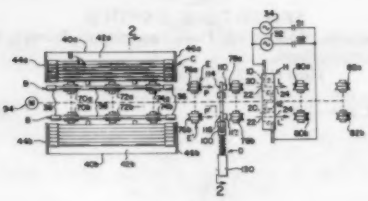
1. A sealed switch comprising a hollow base member of insulator material having a peripheral wall, a bottom, and a rim at an upper surface of said peripheral wall with a perimetric groove extending along said upper surface; an O-ring seal disposed in said groove; a metal cover disposed on said base member to define an interior and an exterior of the switch and having a portion mating with said upper surface compressively against said O-ring seal; electrical switching means disposed in said interior and including a rockably mounted conductive blade disposed generally parallel to said bottom; a manual

actuator having a metal lever handle extending from said exterior to said interior, with a telescoping non-conductive finger resiliently mounted to slide relative thereto and to contact said blade directly and bias it towards said bottom, said lever handle having a metal ball disposed thereon, the metal being of a type which forms a seal when compressively contacted by an O-ring seal of resilient material, a bushing disposed on said cover, having a socket to mate with said ball to permit at least limited rotary motion in at least the direction along said blade and having upper and lower openings leading to said exterior and said interior, respectively, with a first annular groove in said socket extending around said lower opening; an O-ring seal disposed in said annular groove compressively against said ball; means for holding said ball against said O-ring seal; wherein said electrical switching means includes a plurality of contact rivets extending through the base member; a like plurality of terminals secured by said contact rivets, said contact rivets each having a contact head, a shank passing through a cooperating aperture in said base member, a rivet end passing through an aperture in a respective one of said terminals, and a flattened head formed against the respective terminal securing the latter; and respective flat resilient sealing members compressed between the contact heads of said contact rivets and said bottom, with the portions of said bottom underlying said contact heads being substantially flush with adjacent portions of said bottom, so that said contact heads are held off the bottom by said sealing members, wherein said bottom is provided without recesses around said shanks of said contact rivets so that the sides of said flat sealing members facing said bottom are disposed flush with said bottom.

4,482,793
APPARATUS FOR SIMULTANEOUSLY HEATING A PLURALITY OF ELONGATED WORKPIECES

John C. Lewis, Dundas, Canada, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Mar. 15, 1982, Ser. No. 358,446
Int. Cl.³ H05B 9/06
U.S. Cl. 219—10.71 **23 Claims**



1. An apparatus for simultaneously inductively heating a plurality of identical elongated workpieces to a generally similar temperature over the length thereof, said workpieces having a substantially uniform cross-section over a first portion of the workpiece length and a second portion with a cross-section greater than said first portion, said apparatus comprising:

means for conveying said workpieces at the same predetermined uniform rate of speed generally longitudinally along a plurality of similar work paths,

an inductor heating unit having at least two energization levels and having a plurality of identical elongated heating zones, said zones being interconnected to effect simultaneous energization, and each having an entrance end and an exit end and being coaxially disposed about a respective one of said work paths,

adjusting means for positioning the leading ends of all said workpieces to a same predetermined position longitudinally of the respective paths of said workpieces and preceding the entrance end of said heating zones,

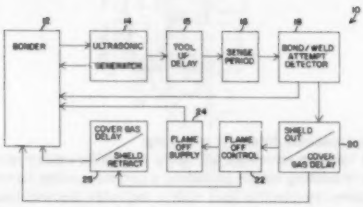
means for sensing when the leading ends of all said workpieces are at said predetermined position, and

means initiated by said sensing means for activating said inductor heating means to the first of said two energization levels for a first predetermined time interval when said first portions of said workpieces are conveyed through their respective said heating zones and activating said heating means to the second of said two heat levels for a second predetermined time interval when said second portions of said workpieces are conveyed through said zones.

4,482,794
PULSE-WIDTH CONTROL OF BONDING BALL FORMATION

John A. Kurtz; Donald E. Cousens, both of Saco, and Mark D. Dufour, Portland, all of Me., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Nov. 28, 1983, Ser. No. 555,696
Int. Cl.³ B23K 11/22
U.S. Cl. 219—56.22 **24 Claims**



23. A method for controlled bonding ball formation at the end of a lead wire held in the bonding tool of a lead wire bonding machine, by arc discharge between the extendable and retractable cover gas delivery shield of the bonding machine and the lead wire, said arc discharge thereby melting and forming a ball at the end of the lead wire for ball bonding to the die pad of an integrated circuit chip, comprising:

generating a first control pulse of first duration for controlling extension of the shield and delivery of cover gas through said shield throughout said first duration;

generating a second control pulse of second duration for introducing a cover gas movement delay before ball formation for displacing oxygen from the shield and the end of the lead wire;

generating a third control pulse of third duration sequentially following the second control pulse for initiating arc discharge between the shield and lead wire;

controlling the duration of the third control pulse for controlling the duration of said arc discharge within an empirically determined time window between the shortest and longest durations of arc discharge which result in optimal ball formation of a substantially spherical ball at the end of the lead wire without necking of the lead wire above the formed ball;

generating a fourth control pulse of fourth duration sequentially following the third control pulse for introducing a cooling delay for cooling a ball formed at the end of the lead wire with cover gas prior to ball bonding;

adjusting the durations of said respective control pulses so that the duration of the first control pulse is substantially the same as or greater than the composite durations of the sequential second, third, and fourth control pulses and substantially coincident in time with said sequential second, third, and fourth control pulses;

applying a high voltage through a resistance to the shield and lead wire in response to the third control pulse for arc discharge between the shield and lead wire for the duration of said third control pulse.

4,482,795

LONGITUDINAL FINNED RESISTANCE WELD PIN

Milton Hinden, Rte. #110, Farmingale, N.Y. 11735

Continuation-in-part of Ser. No. 312,527, Oct. 19, 1981, Pat. No. 4,429,209. This application Nov. 14, 1983, Ser. No. 550,819

Int. Cl.³ B23K 9/20

U.S. Cl. 219—98 5 Claims

1. A metallic welding pin for the attachment of insulated batts to a metallic duct substrate by resistance welding comprising, in combination, an axially elongate shank portion having a head at one end and a sharpened tip at the other end, said head having a planar uppermost contact surface, said tip being conical in configuration, a washer member of greater diameter than said head mounted over said shank and disposed at the junction of said head and shank, said shank including a plurality of generally axially directed ribs extending from a point adjacent said head to the junction of the major diameter of said tip with said shank, the minor diameter of said shank in the areas between said ribs corresponding substantially to the major diameter of said tip, the lowermost ends of said ribs, at their radial innermost ends merging with said minor diameter of said shank at a heightwise position substantially coincident with the junction of said tip and shank, the included angle between said lowermost ends and said tip being less than 180°.

4,482,796

ENERGY-BEAM WELDING MACHINE

Klaus Weissmann, Hanau am Main, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,388

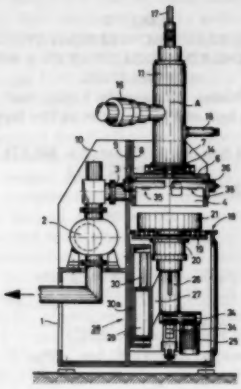
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134018

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 EC 10 Claims

1. In an energy-beam welding machine having means for welding workpieces with the energy beam in a vacuum chamber for receiving the workpieces, the vacuum chamber having opposite, linearly-separable parts of which at least one is adapted to be so linearly separated from the other, for charging the workpieces, to a position spaced from a conveying plane in which the workpieces can be advanced transversely to the linear separation of the parts for the charging, the improvement comprising:

a lifting column in the one part of the vacuum chamber, a workpiece-receiving device carried on one end of the lifting column for receiving the workpieces so conveyed for the charging, means for moving the lifting column in the linear separation direction relative to the one part of



the chamber, and adjustable stop means for varying the extent of the relative movement of the lifting column.

4,482,797

ELECTRODE BIASING WELDING TORCH

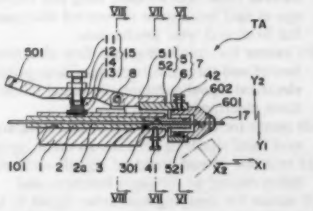
Kousuke Shiramizu, Toyota; Yoshiro Awano, Nagoya; Hiroyuki Takeyama, Okazaki; Kenji Sakakibara, Toyota; Hiroji Okada, Takatsuki, and Hiromu Yamagami, Osaka, all of Japan, assignors to Osaka Transformer Co., Ltd., Osaka and Toyota Jidosha Kabushiki, Aichi, both of, Japan

Filed Jul. 8, 1982, Ser. No. 396,299

Claims priority, application Japan, Nov. 30, 1981, 56-193138

Int. Cl.³ B23K 9/16

U.S. Cl. 219—137.61 12 Claims



5. An improved electric arc welding torch for positioning a consumable electrode relative to work to be welded and for transmitting electrical current to the electrode comprising:

a torch body having an opening therein;

means for insulatively guiding the transmission of the electrode through the torch body opening including a replaceable abrasion resistant guide member positioned at and extending forward of the torch body;

a power feeding member having a central opening, for receiving the electrode, spaced forward of the torch body and encompassing the forward end of the guide member to protect it from any sputtering of the electrode generated by the welding operation;

a support member connected to the power feeding member and movably connected to the torch body; and

biasing means for urging one end of the support member away from the torch body to thereby force the power feeding member into a forced contact with one side of the

electrode for transmission of electrical current to the electrode.

4,482,798

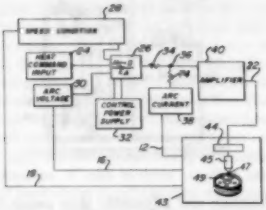
AUTOMATIC ELECTRIC WELDING SYSTEM FOR MAINTAINING UNIFORM HEAT IN A WELDING OPERATION

Richard P. Hurlebaus, Huntingdon Valley, and Herbert H. Kiser, Ambler, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Nov. 15, 1982, Ser. No. 441,971

Int. Cl.³ B23K 9/12

U.S. Cl. 219—137.71 **9 Claims**



1. In an automated system in which welding wire is heated as it is fed from a welding gun including a wire feed mechanism to perform a welding operation on a workpiece as relative movement is maintained between the welding tool and the workpiece,

means for maintaining a fixed level of input heat applied to said workpiece during said welding operation, comprising:

(a) a first electrical signal representing a standard input heat to be applied to said workpiece derived from standard workpiece speed, voltage and current signals required to maintain said fixed level of input heat;

(b) means for developing three electrical signals representing functions relating to the speed of the workpiece, current from said welding tool, and the electrical voltage at said workpiece to control the speed of the wire fed from said wire mechanism;

(c) means for combining said first electrical signal with two of said three electrical signals to produce an output electrical signal substantially equal to the third of said three electrical signals;

(d) means for comparing one of said standard signals with said third signal to produce an error signal;

(e) said one of said standard signals and said third signal being related to the same function, and

(f) means for applying said error signal to said wire feed mechanism to control the speed of the wire fed from said wire mechanism,

whereby the heat input produced in said welding operation is maintained substantially at said fixed level of input heat.

4,482,799

EVAPORATION HEATER

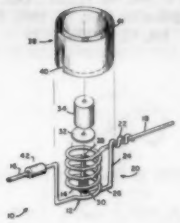
Theodore J. Pricenski, Ipswich, and Edward D. Parent, Hamilton, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 28, 1981, Ser. No. 268,028

Int. Cl.³ F22B 1/28

U.S. Cl. 219—275 **12 Claims**

1. An apparatus for heating evaporant material comprising, a conductive annular heating element having a plurality of conductors mounted thereto, and a material holder including a support arm mounted to one of said conductors outside of said annular heating element, which arm extends proximate the interior of said annular heating element, said material holder mounted on said apparatus for holdding said material in spaced proximity with the interior of said heating element so that energization of said heating element by the application of



electric current therethrough is operative to radiantly heat said material.

4,482,800

CIRCUIT ARRANGEMENT FOR HEATING ELEMENTS IN COOKING SURFACES OF RANGES

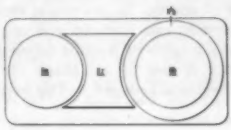
Dieter Schweig, Traunreut, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeraete GmbH, Stuttgart, Fed. Rep. of Germany

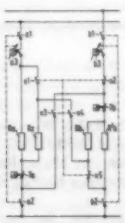
Filed Feb. 9, 1983, Ser. No. 465,110

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204543

Int. Cl.³ H05B 3/68

U.S. Cl. 219—446 **9 Claims**





1. Electrical circuit arrangement for heating elements of cooking surfaces of ranges having at least two individual cooking regions with a respective electrical control device for generating variable heat capacities, the individual cooking regions being connectible together for joint use, comprising electrical heating elements located at the individual cooking regions and disposed on current paths switchable by switching elements in a manner that, in a first switching mode, said heating elements of the individual cooking regions are selectively connected to a respective heat-capacity control device and, in a second switching mode, are jointly connected to one of the heat-capacity control devices, the other of the heat capacity control devices being separated from the respective heating element with which it would otherwise have been connected in said first switching mode.

4,482,801

POSITIVE-TEMPERATURE-COEFFICIENT THERMISTOR HEATING DEVICE

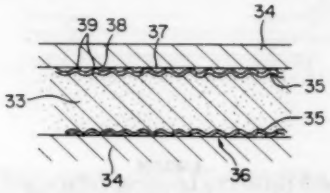
Etsuroh Habata, Nara; Nobumasa Ohshima, and Kenji Kanatani, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 333,917, Dec. 23, 1981, Pat. No. 4,414,052. This application Dec. 14, 1982, Ser. No. 449,581

Claims priority, application Japan, Dec. 26, 1980, 55-186490; Dec. 26, 1980, 55-186494

Int. Cl.³ H05B 3/06

U.S. Cl. 219—540 **2 Claims**



1. A positive-temperature-coefficient (PTC) thermistor heating device, comprising:

a PTC thermistor element having opposite major surfaces with corresponding metallic electrodes disposed thereon and adherent thereto;

metal heat radiating means having a heat transfer surface contiguous with an exposed surface of at least one of said electrodes,

said exposed surfaces of the electrodes having a multiplicity of minute surface irregularities comprising high points and low points, said high points providing direct electrical and mechanical connection between said contiguous surfaces; and

an electrically non-conductive, thermally conductive adhesive bonding said contiguous surfaces together and filling the spaces between said contiguous surfaces due to said irregularities.

4,482,802

TRANSACTION HANDLING SYSTEM

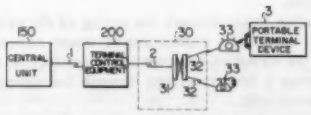
Kuniomi Aizawa, Seto; Yasuyoshi Ohyama, Owariasahi; Yasuo Okuma; Yoshio Okano, both of Seto, and Youichirou Kitamura, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,719

Claims priority, application Japan, Sep. 18, 1981, 56-147465

Int. Cl.³ H04Q 9/00

U.S. Cl. 235—379 **7 Claims**



1. A transaction handling system comprising:

a terminal control equipment connected to a central unit; and

a terminal device connectable through communication means to said terminal control equipment, including means for inputting transaction data at said terminal device and means for transmitting said transaction data together with an address of said terminal device as a transaction message through said terminal control equipment to said central unit to perform data processing in said central unit with respect to the transaction data in said transaction message;

said terminal device having first means for storing in said terminal device first specific information previously assigned to said terminal device to authorize use of said terminal device and second means connected to said first means and said inputting means for generating a transaction message formed of said first specific information, the transaction data and said address; and

said terminal control equipment having third means for storing second specific information previously registered therein at storage locations corresponding to the addresses of said terminal devices to be connected to said terminal control equipment regarding use authorization of said terminal devices, fourth means connected to said third means so that when receiving said transaction message via said communication means from a terminal device, the relation between said fist specific information included in said transaction message and said second specific information read out of said third means according to said address included in said transaction message is being checked by said fourth means, and fifth means responsive to the result of the checking operation by said fourth means for controlling the transmission of said transaction message to said central unit, wherein a terminal device not authorized is prohibited from communicating with said central unit.

4,482,803

OPTICAL SENSOR FOR FOCUSING CONTROL

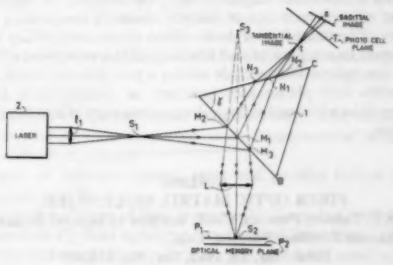
Jean-Pierre Lacotte; Bernard Fichot, and Gilles Troude, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 22, 1982, Ser. No. 360,664

Claims priority, application France, Mar. 24, 1981, 81 05854

Int. Cl.³ G01J 1/20

U.S. Cl. 250—201 **6 Claims**



1. In an optical recording system including a movable recording medium, an optical source and a lens for focusing an optical beam from said optical source on said recording medium, means for controlling the position of said lens, said means for controlling comprising:

refracting means having first and second planar faces, said first planar face being positioned for reflecting said optical beam, said reflected beam passing through said lens for focusing on said recording medium, a portion of said reflected and focused beam being reflected back through said lens and transmitted through said refracting means, said refracting means being arranged to astigmatize said reflected and focused beam to form an astigmatized beam defining a circle of least confusion;

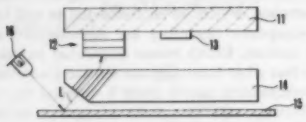
photoelectric means for detecting in a first plane an elongation of a spot projected on said first plane by said astigmatized beam and outputting an electric a signal representative of a degree and direction of said elongation.

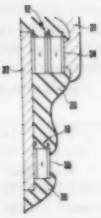
4,482,804

PHOTOSENSOR ARRAY WHEREIN EACH PHOTOSENSOR COMPRISES A PLURALITY OF AMORPHOUS SILICON P-I-N DIODES

Ryoji Oritsuki; Yukio Ichimura, both of Mobara; Hiromi Kanai, Chiba, and Kenichi Shimada, Chosei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,563
Claims priority, application Japan, Sep. 18, 1981, 56-146267
Int. Cl.³ H04N *1/036*
U.S. Cl. 250—211 J **1 Claim**





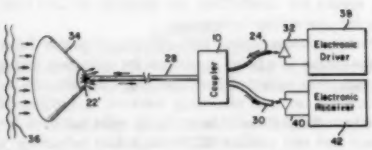
1. In a photosensor apparatus of the type including one dimensional photosensor array in which a plurality of photosensors mounted on a transparent substrate at a predetermined spacing are respectively connected in series with blocking diodes which select outputs of said photosensors, the improvement wherein each one of said photosensors comprises a plurality of laminated amorphous silicon diodes comprising p-i-n junction layers, each of said blocking diodes comprises at least one amorphous silicon diode having a p-i-n junction layer, and wherein each photosensor generates an electromotive force larger than a forward voltage drop across each of said blocking diodes.

4,482,805

FIBER OPTIC MATRIX MULTIPLIER

John P. Palmer, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Mar. 15, 1982, Ser. No. 358,499
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **29 Claims**



1. A matrix multiplier system comprising:

a plurality of unidirectional fiber optic couplers, each having an input fiber, a bidirectional fiber, and an output fiber and being effective to couple light signals from the input fiber unidirectionally to the bidirectional fiber in a first direction of light transmission with light traversing the bidirectional fiber in a reverse direction being directed to the output fiber;

means for applying a multi-dimensional vector signal to the plurality of input fibers; and

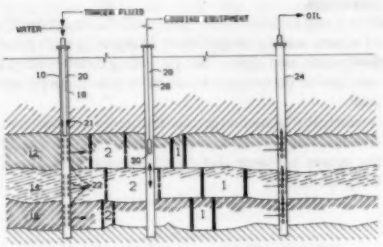
means for reflecting light transmitted along the bidirectional fiber in said first direction back along the fiber in the reverse direction in accordance with a multi-dimensional matrix having selected components for individually controlling the reflection of light signals back into the individual bidirectional fibers to develop a second multi-dimensional vector at said output fibers corresponding to the multiplication of the first multi-dimensional vector by said matrix.

4,482,806

MULTI-TRACER LOGGING TECHNIQUE

Ovner R. Wagner, Jr., Broken Arrow; Robert P. Murphy, Jr., Bixby; Dwight L. Dauben, Tulsa, all of Okla., and Roger L. Smith, Woodlands, Tex., assignors to The Standard Oil Company, Chicago, Ill.

Filed Oct. 26, 1981, Ser. No. 315,087
Int. Cl.³ G01V *5/00*
U.S. Cl. 250—260 **2 Claims**



1. A method of determining flood sweep efficiency and effective permeability changes in a formation caused by the flood by logging at least one radioactive tracer in an underground formation containing fluids and penetrated by an injection well and a production well, which has a casing and an annular space between the casing and wellbore, comprising in sequence:

(a) injecting a tracer fluid through the injection well into the formation;

(b) producing fluids through the casing of the production well to establish a representative tracer concentration within the formation adjacent to the production well;

(c) obtaining a first tracer log through the casing of the production well;

(d) injecting a fluid under pressure into the annular space while producing fluids through the casing of the production well to displace any tracer present in the production well;

(e) injecting the fluid at a greater pressure than in step (d) to equalize fluid pressures in the formation; and

(f) obtaining a second tracer log through the casing of the production well, whereby the first and the second tracer logs are comparably analyzed to determine the flood sweep efficiency and the effective permeability changes in the formation.

4,482,807

IMAGING DEVICES AND SYSTEMS

Anthony Blackburn, Southampton, and John B. Readhead, Lyndhurst, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,839

Claims priority, application United Kingdom, Mar. 30, 1981, 8109819

Int. Cl.³ H01J 31/49

U.S. Cl. 250—334 16 Claims

1. A thermal-radiation imaging device comprising:

a strip of semiconductor material in which free charge carriers can be generated on absorption of thermal radiation incident on the strip, said strip having a length and a width and two sides;

biasing electrode means for causing a bias current predominantly of majority charge carriers to flow along the length of the strip, said bias current being capable of supporting an ambipolar drift of radiation-generated minority charge carriers in a direction opposite to the bias current; and

a pair of readout electrodes arranged adjacent to the semiconductor strip, said readout electrodes defining a readout area in the semiconductor strip which is between the readout electrodes and which is in the path of the ambipolar drift;

characterized in that in the readout area the semiconductor strip has at least one space forming at least one bend in one side of the strip, said space extending from the one side of the strip across part of the width of the strip, said space being arranged to reduce the width of the semiconductor strip in the readout area thereby increasing the electric field in the readout area.

4,482,808

APPARATUS FOR MEASURING NEUTRONS AND GAMMA RAYS

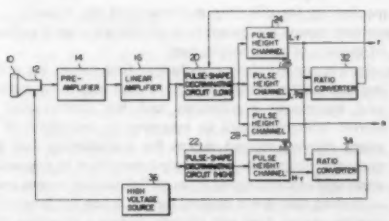
Hiroshi Tominaga; Yoshihiro Sase, and Shoichi Horiuchi, all of Katsuta, Japan, assignors to Hitachi, Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,724

Claims priority, application Japan, Jan. 28, 1981, 56-10212

Int. Cl.³ G01T 3/06

U.S. Cl. 250—392 6 Claims



1. An apparatus for measuring neutrons and gamma rays comprising

a detector for detecting both neutrons and gamma rays;

a pulse-shape discrimination circuit for output pulses of said detector to discriminate between pulses generated by neutrons and pulses generated by gamma rays;

counters for counting said pulses generated by neutrons and said pulses generated by gamma rays; and

means for obtaining a ratio between two different counted values for either said pulses generated by neutrons or said pulses generated by gamma rays to control said discrimination circuit so that the ratio between said two counted values is kept constant.

4,482,809

ULTRAVIOLET FLUID PURIFYING DEVICE

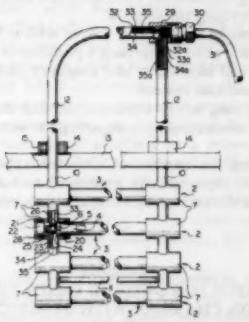
Jan M. Maarschalkerweerd, London, Canada, assignor to Trojan Technologies Inc., London, Canada

Continuation of Ser. No. 382,146, May 26, 1982, abandoned. This application May 18, 1984, Ser. No. 611,912

Claims priority, application Canada, Nov. 30, 1981, 391198

Int. Cl.³ G01N 21/01; A61L 2/10

U.S. Cl. 250—436 10 Claims



1. An ultraviolet light waste water purifying device comprising

a support frame;

a plurality of separately removable fluid immersible ultraviolet lamp modules supported on the frame, each of the said modules including:

a pair of opposed, spaced apart and parallel hollow leg sections (10);

a plurality of pairs of fluid impermeable lamp unit receiving sockets (7) fluid tightly secured to said leg sections (10), the sockets of the pairs being in alignmment to receive the lamps, and the pairs being longitudinally staggered along the leg sections to permit placement of a plurality of lamps (4) in any one module;

the lamp units (3) being supported by and extending between each pair of said lamp unit receiving sockets (7), each of said lamp units (3) comprising an inner, elongate, cylindrical ultraviolet ray emitting lamp (4) and an outer, co-axial and substantially co-extensive ultraviolet light transmissive cylindrical jacket (5) surrounding said lamp (4);

means (20) for sealing the outer cylindrical jacket (5) into aligned, opposed sockets forming a pair;

electrical contact means (24) included in each of said sockets (7) which are in electrical engagement with said lamps (4),

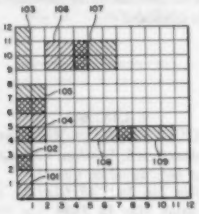
at least one socket (7) in each of said socket pairs at its end remote from said lamp unit including lamp access means collinear with the lamp (4); and

removable fluid impermeable closure means (28, 22) sealing the access means into the respective socket to permit individual withdrawal of a lamp from the respective socket.

4,482,810
ELECTRON BEAM EXPOSURE SYSTEM

Larry Cooke, Cupertino, Calif., assignor to Storage Technology Partners, Louisville, Colo.

Filed Sep. 30, 1982, Ser. No. 431,869
Int. Cl.³ H01J 37/302
U.S. Cl. 250—492.2 17 Claims



1. A method of defining a first pattern comprised of a plurality of shapes, arranged in a coordinate system having a plurality of defining coordinates, a plurality of which shapes overlap, or abut, comprising the steps of:

(a) representing each of said shapes with at least one digital word, said word comprising a plurality of bits that define the size and location of said shapes of said first pattern in said coordinate system;

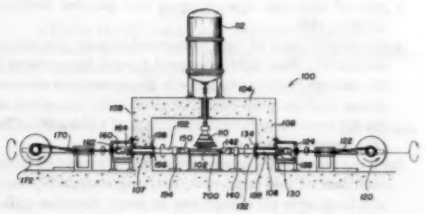
(b) determining where a plurality of said shapes overlap or abut by electronically comparing the bits of said words; and

(c) reducing the number of said overlapping or abutting shapes by electronically processing said digital words to merge said overlapping or abutting shapes into a smaller number.

4,482,811
APPARATUS FOR GUIDING CABLE THROUGH A RADIATION CHAMBER WITH REDUCED LEAKAGE THEREFROM

Robert G. Burgess, Smithtown, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,438
Int. Cl.³ G21F 7/00
U.S. Cl. 250—492.3 28 Claims



1. In a system having a shielded irradiation chamber with (a) a length and (b) two apertures at each end thereof through which cable to be irradiated can travel longitudinally, apparatus comprising:

means for (a) preventing radiation leakage through the apertures and (b) guiding the cable;

the leakage preventing the guiding means including, for each aperture, a plurality of rollers each of which abuts against the cable with the circumferential surface thereof, each roller being rotated about the respective axis thereof as the cable travels longitudinally, the axis of each roller being transverse to the direction of cable travel,

the rollers forming a plurality of sets of rollers, each set including rollers disposed at angular intervals about the longitudinal axis of the cable, the sets being (a) longitudinally spaced along the path of the cable and (b) positioned to block radiation from exiting the chamber through the apertures;

means for rotating the cable about the longitudinal axis thereof, the cable being rotatable as the cable travels longitudinally; and

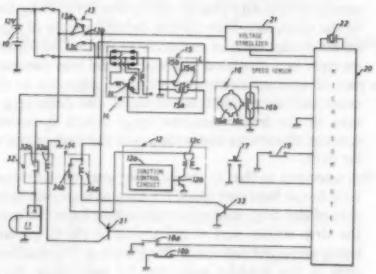
means for rotating the cable about the longitudinal axis thereof, the cable being rotatable as the cable travels longitudinally; and

means for revolving each set of rollers about the longitudinal axis of the cable in synchrony with the rotation of the cable.

4,482,812
ENGINE AUTOMATIC CONTROL SYSTEM FOR VEHICLES

Shinichi Hori, Anjo; Yasuichi Ohnishi; Makoto Ono, both of Kariya; Masahiro Ueda, and Masahiko Noba, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 16, 1982, Ser. No. 398,879
Claims priority, application Japan, Jul. 21, 1981, 56-114167
Int. Cl.³ H02P 9/04; F02N 11/00, 17/02
U.S. Cl. 290—38 R 7 Claims



1. A control system for controlling the operation of a vehicle prime mover comprising:

setting means for providing a set signal for control of the operation of said prime mover;

a starter control circuit which in its activated condition connects a starter motor of said prime mover to an electric power source and in its deactivated condition disconnects said starter motor from said power source;

a drive control circuit which in its deactivated condition maintains the operative condition of said prime mover and in its activated condition automatically renders said prime mover inoperative;

a mechanism for effecting movement of the vehicle;

detecting means for generating an electric signal indicative of motion of the vehicle; and

an electric control device including first means for activating said starter control circuit in response to operation of said movement mechanism and for deactivating said starter control circuit in response to operation of said prime mover, second means for maintaining said drive control circuit in its deactivated condition in dependence upon said electric signal from said detecting means and for activating said drive control circuit when the level of said electric signal does not change during a stopping of the vehicle, and means for enabling the performance of the functions of said starter and drive control circuits in response to said set signal and said electric signal from said detecting means and for disabling the performance of the functions of said starter and drive control circuits when

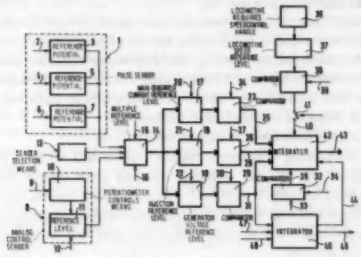
the level of said electric signal does not change during movement of the vehicle.

4,482,813

REGULATOR SYSTEM FOR A DIESEL ELECTRIC LOCOMOTIVE

Philippe Grand-Perret, Paris, and Bernard Lerouge, Chatou, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Mar. 25, 1983, Ser. No. 478,770
Claims priority, application France, Mar. 26, 1982, 82 05162
Int. Cl.³ H02P 5/00; B60I 11/04
U.S. Cl. 290—40 R **4 Claims**



1. A regulator system for a locomotive having a Diesel engine including an injection pump positioning device, said engine driving a main generator which supplies electric power to the traction motors which drive the locomotive, said regulator system comprising:

a first electric power regulator to regulate the electric power of said main generator and a second regulator to regulate the Diesel engine,

at least one driver control operated by the engine driver for controlling said first electric power regulator including means for setting a multiple purpose reference level from which particular reference levels are derived, establishing mainly a main generator current reference level, a main generator voltage reference level, a Diesel engine injection reference level,

a comparator for comparing each said level with a signal for measuring said true current, true potential or true injection, respectively,

an integrator,

each of the difference signals resulting from the measured level and the reference level being introduced into said integrator in such a way that the integrator delivers an increase order to a main generator excitation device if said measurement signals are lower than said reference levels and a decrease order if at least of said measurement signals is equal to or higher than the corresponding reference level, and

means for establishing a temporary reference level for the speed of the power generator on measuring the injection of the gas oil in the Diesel engine in accordance with a predetermined speed injection law, then of a permanent Diesel engine speed reference level after integration of an external Diesel engine speed reference level to regulate the Diesel engine power automatically,

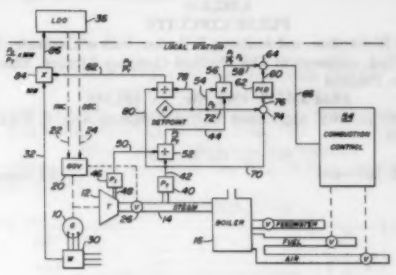
a second comparator for comparing said permanent speed reference level with a signal for measuring the true Diesel engine speed with the output of said comparator supplying an injection increase order if said true Diesel engine speed measurement signal is lower than said permanent Diesel engine speed reference level and an injection decrease order if said Diesel engine true speed measurement signal is higher than said permanent Diesel engine speed reference level to said injection pump positioning device.

4,482,814

LOAD-FREQUENCY CONTROL SYSTEM

James H. Daniels, North Wales, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 20, 1983, Ser. No. 543,721
Int. Cl.³ F01K 13/02
U.S. Cl. 290—40 B **3 Claims**



1. In a control system for regulating the generation of a governor controlled turbine driven generator at a local power station of an interconnected group of stations wherein the control system provides from a load dispatcher control signals to the governor which continually change the generation so long as there is a change in generation required to meet the desired system conditions and inputs to a boiler supplying steam to the turbine are modified by a pressure controller responding to deviations of the turbine throttle pressure from its desired value and wherein a signal representative of the actual generation of said generator is fed back to the load dispatcher to enable determination as to when a required level of generation is reached by said generator, the improvement comprising:

means for producing a signal representative of the ratio of throttle pressure set point to actual throttle pressure; and

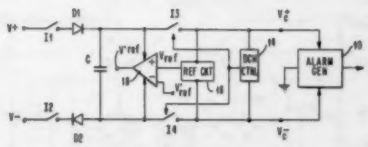
means for multiplying the signal representative of acutal generation by said ratio and supplying the resulting product as the sole feedback to the load dispatcher for determining an allocation of control signals to said generator.

4,482,815

FLOATING BACK-UP POWER SUPPLY

Gérard Orengo, Biot, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,542
Claims priority, application European Pat. Off., Feb. 25, 1982, 82430005
Int. Cl.³ H02J 1/06
U.S. Cl. 307—44 **10 Claims**



1. A power supply circuit for providing adjustable voltage levels from a floating voltage source, said power supply circuit including:

a reference circuit connected to the terminals of said floating voltage source and generating a first voltage reference;

a second voltage reference source; and

a voltage follower circuit connected to said first and second voltage reference sources and to said floating voltage source; said follower circuit adjusting the difference of potential across the terminals of said floating voltage source so that said first and second voltage references are forced to the same voltage level.

4,482,816

PULSE CIRCUITS

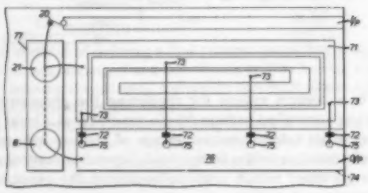
Robert Richardson, and Anthony T. Barker, both of Chelmsford, England, assignors to The Marconi Company Limited, Stanmore, England

Filed Jul. 27, 1982, Ser. No. 402,343

Claims priority, application United Kingdom, Aug. 8, 1981, 8124319

Int. Cl.³ H03K *3/45*

U.S. Cl. 307—106 **5 Claims**



1. A pulse circuit including a plurality of pulse forming networks, each network comprising an inductor formed as a coiled thin conductive layer lying on the surface of an electrically insulating board, and a plurality of capacitors mounted on the board and electrically connected to predetermined points of the conductive track; the networks being mounted on a common multilayer printed circuit board which connects the outputs of the plurality of pulse forming networks in parallel to a common load, two conductive layers of the common board constituting respective current flow and return paths to minimise the inductance of the connection; and means for periodically charging and then discharging the inductor and the capacitors of the networks to generate an electrical pulse of predetermined characteristics.

4,482,817

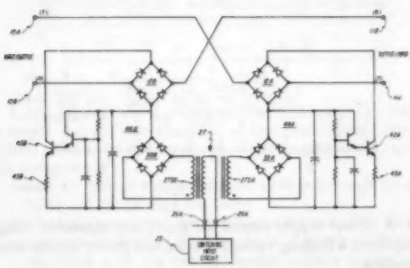
BILATERAL ELECTRONIC SWITCH

Barrie Brightman; Frank Niertit, both of Casselberry, and Joseph A. Hartman, Longwood, all of Fla., assignors to Stromberg-Carlson, Longwood, Fla.

Filed Dec. 30, 1981, Ser. No. 335,649

Int. Cl.³ H03K *17/74*

U.S. Cl. 307—257 **8 Claims**



1. A bilateral, low loss, wide band switching circuit for conveying signals between first and second terminal means in response to a switching signal at a third terminal means, said switching circuit comprising:

A. bilateral current gate means having first and second parallel, unidirectional, conducting path means for conveying DC current from an input junction means to an output junction means, each path means including a pair of diode means with the junction between each pair defining a balance point junction means, each said balance point junction means connecting to one of said first and second terminal means;

B. full-wave rectifier means including a plurality of diode means for generating, at an output means, a DC current in response to signals at input means, said output means being connected to said input junction means of said bilateral current gate means;

C. control signal circuit means connected to said third terminal means and to said input means of said full-wave rectifier means for energizing said full-wave rectifier means in response to the switching signal thereby to forward bias the first and second unidirectional current path means in said bilateral current gate means; and

D. controllable switch means comprising:

(i) switching transistor means connected to said output junction of said bilateral current gate means and the input means of said full-wave rectifier means for forming a current path between said output junction of said bilateral current gate means and said full-wave rectifier means, and

(ii) control circuit means connected to said full-wave rectifier means and said switching transistor means for controlling conduction through said switching transistor means to forward bias the first and second unidirectional current path means in said bilateral current gate means, said control circuit means including:

(a) bias transistor means connected to said switching transistor means, and

(b) filter means connected to said bias transistor and said full-wave rectifier means, said filter means controlling said bias transistor means in response to a signal from said full-wave rectifier means produced in response to the switching signal.

4,482,818

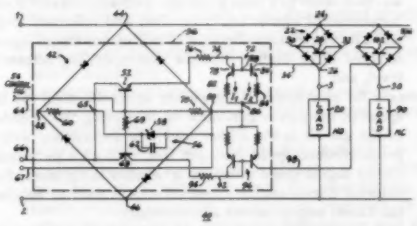
UNIVERSAL FIELD CONVERTIBLE 3-WIRE SWITCH

Lawrence J. Ryczek, Greendale, and Donald L. Van Zeeland, Greenfield, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 9, 1982, Ser. No. 367,150

Int. Cl.³ H03K *17/74, 5/00*

U.S. Cl. 307—257 **39 Claims**



1. A universal 3-wire switch module adapted to have a first P type DC configuration, a second N type DC configuration, a third P type AC configuration and a fourth N type AC configuration as programmed by installation wire connection, without internal changes to the switch module, comprising:

first and second main terminals for connection to either an AC or DC power source;

a third load terminal for connection to a load, said load being

further connected to one of said first and second main terminals;

a rectifier bridge connected at its AC inputs between said first and third terminals;

nonlatching switching means connected to said bridge for blocking and passing current therethrough for controlling energization of said load;

trigger means for controlling the conduction state of said switch means;

said switch module having said first P type DC configuration when said first terminal is connected to the positive side of a DC power source and said second terminal is connected to the negative side of the DC power source;

said switch module having said second N type DC configuration when said first terminal is connected to the negative side of a DC power source and said second terminal is connected to the positive side of the DC power source;

said switch module having said third P type AC configuration when said first terminal is connected to the hot side of AC power source and said second terminal is connected to the neutral side of the AC power source;

said switch module having said fourth N type AC configuration when said first terminal is connected to the neutral side of an AC power source and said second terminal is connected to the hot side of the AC power source;

said first, second, third and fourth configurations are furnished by a single universal said switch module as wire programmed at installation, and affording field convertibility between said first, second, third and fourth configurations without internal changes to said switch module.

4,482,819

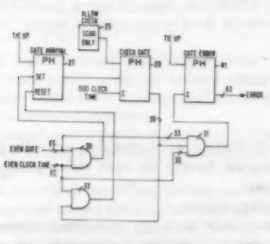
DATA PROCESSOR SYSTEM CLOCK CHECKING SYSTEM

Bharat J. Oza, Endicott, and Thomas J. Roche, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,270

Int. Cl.³ H03L *7/00, 1/00*

U.S. Cl. 307—269 **5 Claims**



1. In a timing pulse distribution system in which first and second pairs of timing pulse signals and gate signals are supplied recurrently to inputs of timing pulse receiving elements, said gate pulses occurring in synchronism with said timing pulses and having a width greater than said timing pulses and centered on associated timing pulses, checking means connected to the inputs of said timing pulse receiving elements for checking the sequence and duration of said gate pulses with respect to said timing pulses, said checking means comprising, in combination:

a first and a second bistable storage element;

first circuit means connecte between said inputs and said first bistable element for setting said first bistable element in a first state during the coincidence of a timing pulse signal and a gate signal from the first of said pairs of timing pulse signals and gate signals at said inputs;

second circuit means connected between said first and said second bistable storage element for setting said second bistable element in a first state when, and only when, said first bistable element is in its first state and a timing pulse of the second of said pairs of timing pulse signals and gate signals is received in said second bistable element; and

third circuit means operatively coupled to said second bistable storage element for providing an indication of the state of said second bistable storage element during the occurrence of a first pair of said timing pulse signals and gate signals at said inputs.

4,482,820

INTEGRATED CIRCUIT HAVING STRAY CAPACITANCE COMPENSATION

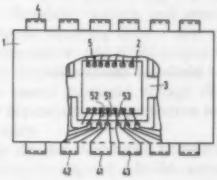
Cord H. Kohsiek, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1982, Ser. No. 378,568

Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121671

Int. Cl.³ H03K *17/00*

U.S. Cl. 307—303 **6 Claims**



1. A circuit arrangement comprising an integrated semiconductor circuit, which circuit comprises a housing with a plurality of connection leads, stray capacitances with equal temperature coefficients existing between a first connection lead and the two adjacent, second and third, connection leads, characterized in that for reducing the effect of the stray capacitances on the signal at the first connection lead means are provided for generating a compensation voltage and applying said voltage between the first and third connection leads for causing a current to flow through the stray capacitance between the first and third connection leads, which current is equal and opposite to the current through the stray capacitance between the first and second connection leads.

4,482,821

SUPERCONDUCTIVE LOGIC CIRCUIT

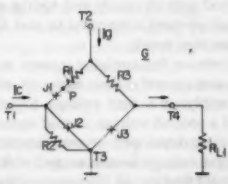
Kouji Houkawa, Iruma; Akira Ishida, and Masaru Okada, both of Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jun. 3, 1981, Ser. No. 269,874

Claims priority, application Japan, Jun. 10, 1980, 55-78082; Feb. 9, 1981, 56-17678; Feb. 9, 1981, 56-17679; Feb. 9, 1981, 56-17680; Feb. 9, 1981, 56-17681; Feb. 9, 1981, 56-17682

Int. Cl.³ H03K *19/195*

U.S. Cl. 307—462 **29 Claims**



1. A superconductive logic circuit comprising:

a basic logic gate, said basic logic gate including first and

second input terminals connected at least at two nodes of a first bridge circuit having four branches;

an output terminal connected at least at one node of said bridge circuit;

a series circuit including a first resistor and a first Josephson junction connected between said first and second input terminals to comprise the first branch of said bridge circuit;

a parallel circuit including a second resistor and a second Josephson junction connected between said first input terminal and a grounding terminal of said bridge circuit to comprise the second branch of said bridge circuit;

a third resistor connected between said second input terminal and one of said nodes of said bridge circuit to comprise the third branch of said bridge circuit; and

a third Josephson junction connected between said node with the third resistor and said grounding terminal to comprise the fourth branch of said bridge circuit.

4,482,822

SEMICONDUCTOR CHIP SELECTION CIRCUIT HAVING PROGRAMMABLE LEVEL CONTROL CIRCUITRY USING ENHANCEMENT/DEPLETION-MODE MOS DEVICES

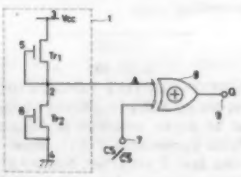
Setsufumi Kamuro, Yamatokoriyama, and Yoshifumi Masaki, Tondabayashi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 21, 1981, Ser. No. 226,762

Claims priority, application Japan, Jan. 21, 1980, 55-6164[U]; Jan. 21, 1980, 55-5988

Int. Cl.³ H03K *19/094, 19/21*

U.S. Cl. 307—468 **9 Claims**



1. A chip selection circuit for addressing one of a plurality of semiconductor circuits comprising:

a first circuit element formed of an MOS transistor having an interconnected gate electrode and source electrode;

a second circuit element connected to said first circuit element at a junction point;

power supply means for applying power across said connected first and second circuit elements, said power supply means applying a first voltage to said first circuit element and a second voltage to said second element;

the voltage being developed at said junction point being either said first voltage or said second voltage depending on whether said first circuit element is of the enhancement type or depletion type; and

exclusive OR logic means receiving the voltage developed at said junction point and a chip selection enabling signal and developing a chip selection signal.

4,482,823

RPM-TO-VOLTAGE CONVERTER

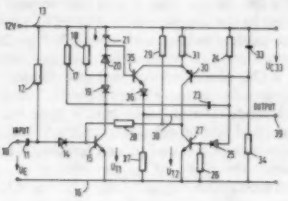
Wolf Wessel, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

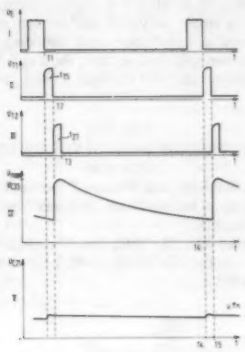
Filed May 12, 1982, Ser. No. 377,488

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119820

Int. Cl.³ H03K *4/04, 9/06, 11/00*

U.S. Cl. 307—519 **1 Claim**





1. An rpm-to-voltage converter for controlling an internal combustion engine having an rpm pulse generating means which comprises:

a direct voltage source;

a capacitor-resistor network connected across the direct voltage source, including a capacitor, an ouput, and a resistor connected in series arrangement, the capacitance and resistance values of the capacitor-resistor network being selected so that between successive rpm pulses, the output voltage of the capacitor-resistor network varies along a voltage-time curve which approximates a hyperbola;

an emitter follower circuit means for detecting and following the output voltage of the capacitor-resistor network;

at least one timing circuit means activated by rpm pulses having a frequency proportional to rpm, including a capacitor discharge timing circuit means for discharging said capacitor during a predetermined capacitor discharging period following each rpm pulse; and

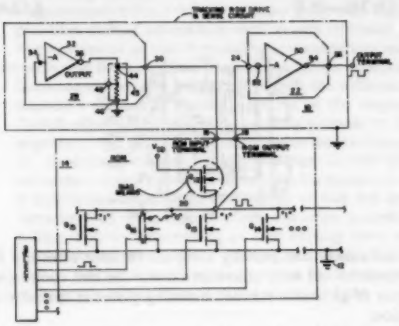
memory means for storing the most recent occurring final output voltage value of the capacitor-resistor network following each rpm impulse and before said discharging of said capacitor, wherein a new capacitor charging occurs after said most recent output voltage is stored by said storage means.

4,482,824

TRACKING ROM DRIVE AND SENSE CIRCUIT

Chin-Pyng J. Tzeng, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 12, 1982, Ser. No. 397,648
Int. Cl.[3] H03K 5/153; G11C 7/06
U.S. Cl. 307—530 10 Claims



1. A tracking ROM drive and sense circuit formed on a monolithic integrated circuit and operating between a voltage source and a reference potential, such as ground and being coupled to drive and sense a ROM having a ROM input terinal; and a ROM output terminal, said ROM also having a ROM bias means interposed between said ROM input terminal and said ROm output terminal, and an array of selectable read only memory cells powered by said ROM bias means and operating in parallel between said ROM output terminal and said reference potential,

said ROM providing an output signal at said ROM output terminal, said ROM output signal having a first and second logic level, said first and second logic level voltages characterizing a ROM output signal midpoint voltage substantially between said first and second logic levels, said ROM alternately switching said output signal between said logic levels through said ROM output signal midpoint voltage in response to each memory cell selection;

said ROM input terminal receiving a drive voltage, said ROM output signal midpoint voltage being adjusted by adjustment of said drive voltage, said tracking ROM drive and sense circuit comprising:

a drive circuit, said drive circuit having an output terminal coupled to said ROM input terminal, said drive circuit having,

a first inverting amplifier, having an output terminal connected to said drive circuit output terminal and an input terminal,

a voltage divider network, said voltage divider network having a sense terminal, a reference voltage terminal and an output terminal,

said voltage divider network sense terminal being connected to said drive circuit output terminal;

said voltage divider network reference voltage terminal being connected to said reference potential, said voltage divider network output terminal being connected to said first inverting amplifier input terminal,

said first inverting amplifier having;

first, second, third, and fourth multiterminal semiconductor devices, each respective multiterminal semiconductor device having a control grid and a conduction channel having a first and second terminal;

said first and third multiterminal semiconductor device conduction channel first terminals being connected to said voltage source, said first multiterminal semiconductor device conduction channel second terminal being connected to said first multiterminal semiconductor device control grid, to said fourth multiterminal semiconductor device conduction channel second terminal and to said second multiterminal semiconductor device conduction channel first terminal,

said second multiterminal semiconductor device conduction channel second terminal being connected to said reference potential, said second multiterminal semiconductor device control grid being connected to said fourth multiterminal semiconductor device control grid and to said first inverting amplifier input terminal,

said fourth multiterminal semiconductor device conduction channel first terminal being connected to said third multiterminal semiconductor device conduction channel second terminal, to said third multiterminal semiconductor device control grid and to said first inverting amplifier output terminal;

a sense amplifier means having an input terminal coupled to said ROM output terminal for providing an output signal at a sense amplifier means output terminal in response to said ROM output signal at said sense amplifier input terminal penetrating a predetermined sense amplifier threshold voltage, said sense amplifier means output signal changing from a first to a second logic level in response to said ROM output signal penetrating said sense amplifier means threshold voltage, said sense amplifier means threshold voltage changing in a temperature dependent, voltage source and process dependent relation;

said voltage divider ratio being trimmed to set the ROM drive voltage to adjust the ROM output signal midpoint voltage to substantially equal said sense amplifier threshold voltage;

said drive voltage being characterized to continually adjust said ROM output signal midpoint voltage to remain essentially equivalent to said sense amplifier means threshold voltage in a sense amplifier means threshold voltage temperature dependent, voltage source dependent and process dependent change accommodating relation;

whereby, said ROM being responsive to said drive voltage, adjusts said ROM output signal first and second logic level voltage range to compensate for said sense amplifier means temperature dependent threshold voltage change, thereby improving sense amplifier means ROM output signal logic level detecting margin.

4,482,825

SEMICONDUCTOR DEVICE HAVING A CIRCUIT FOR GENERATING A VOLTAGE HIGHER THAN A SUPPLY VOLTAGE AND RESPONSIVE TO VARIATIONS IN THE SUPPLY VOLTAGE

Shigeki Nozaki, Kawasaki; Yoshihiro Takemae, Yokohama; Katsuhiko Kabashima, Kawasaki, and Seiji Enomoto, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 2, 1981, Ser. No. 326,899
Claims priority, application Japan, Dec. 3, 1980, 55-170748
Int. Cl.[3] H03K 17/06, 17/14, 17/16; H01L 27/02
U.S. Cl. 307—578 5 Claims

1. A semiconductor device comprising:

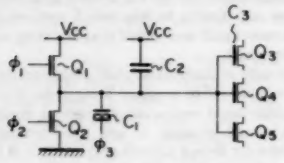
a voltage supply means for providing power;

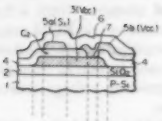
signal generating circuit means, having an output node, for cutting said voltage supply means off from said output node and for generating at said output node a first output signal having a voltage higher than that of said voltage supply means;

a signal line layer connected to said output node;

a transistor including a source for providing a second output signal, a gate connected to said signal line layer and a drain connected to said voltage supply means at least at a time after said output node is cut off from said voltage supply means; and

means for following the potential of said voltage supply means by making the potential of said signal line layer





follow the potential of said voltage supply means after said signal line layer is cut off from said voltage supply means.

4,482,826

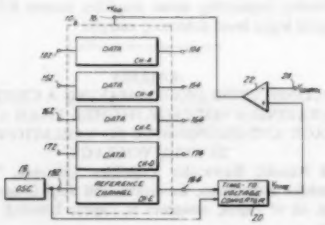
PROGRAMMABLE DELAY DEVICE

Stephen C. Ems, Sloatsberg, and Brian M. Yamrone, Ardsley, both of N.Y., assignors to LeCroy Research Systems Corporation, Spring Valley, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,051

Int. Cl.³ H03K *5/159*

U.S. Cl. 307—602 **16 Claims**



1. A programmable delay circuit comprising a channel of cascaded, directly coupled inverter elements; a power supply terminal coupled to said channel for supplying an operating voltage to said inverter elements; a source of operating voltage coupled to said power supply terminal; and modifying means for modifying said operating voltage to establish a desired time delay exhibited by said channel as a function of the magnitude of the operating voltage supplied to said power supply terminal; said modifying means comprising voltage generating means for generating a voltage representing the actual time delay exhibited by said channel; means for supplying a reference voltage representing said desired time delay; and comparison means for comparing said generated and reference voltages and for adjusting the operating voltage supplied to said power supply terminal as a function of the difference therebetween.

4,482,827

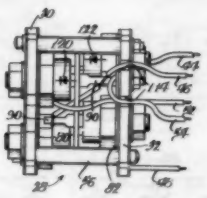
AXIALLY AND RADIALLY COMPACT FULL WAVE RECTIFIER ASSEMBLY FOR AN ALTERNATOR

Jeffrey D. Baldwin, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 24, 1983, Ser. No. 507,511

Int. Cl.³ H02K *19/38*

U.S. Cl. 310—68 D **8 Claims**



1. An axially and radially compact rectifier assembly for incorporation in a rotor of an alternator or the like, comprising:

a pair of generally parallel mounting plates in spaced relation;

each of said plates having three apertures arranged to define an equilateral triangle, the apertures in one plate being nonaligned with the apertures in the other plate;

Six diodes, one for each said aperture, each having a base forming one pole of the electrical circuit of the diode and received in an associated aperture in a corresponding plate to be mounted thereon, each diode further including a terminal forming the other pole of said electrical circuit and directed axially oppositely of the corresponding base;

the spacing between said plates and the orientation of the diodes thereon being such that the terminals of the diodes on one said plate nest between the terminals of the diodes on the other said plate and are in close proximity to but out of contact with the plate other than that on which the associated diode is mounted and all of the terminals are located between said plates;

a pair of thin plate-like busses, one for each mounting plate and in non-electrically conductive abutment therewith, said bases being in electrical contact with the bus associated with the corresponding plate;

circuit means between said plates interconnecting pairs of said terminals to define a full wave rectifier; and

means securing said plates in said spaced relation.

4,482,828

DISCONNECTABLE ELECTROMAGNETIC ECCENTRIC ACTUATOR

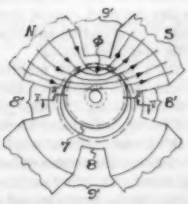
Jacques Vergues, Valence, and Roland Rubet, Chabeuil, both of France, assignors to CROUZET, Paris, France

Filed Oct. 26, 1982, Ser. No. 436,709

Claims priority, application France, Oct. 29, 1981, 81 20503

Int. Cl.³ F16H *27/10, 1/18*

U.S. Cl. 310—83 **1 Claim**



1. A disconnectable electromagnetic eccentric actuator for

controlling a mobile member for automatically adjusting a machine comprising:

ferromagnetic drive force transmitting means for converting into axial movement the cycloidal rotating movement of at least one mobile element relative to a fixed element, the fixed element comprising an integral part of means for converting an electromotive force into a displaceable magnetomotive force with a resultant generated flux that provokes mutual adhesion as well as said cycloidal relative movement of said ferromagnetic transmitting means;

wherein said ferromagnetic transmitting means comprises a ferromagnetic screw and nut in which the difference in diameters as well as the arrangement of the respective threads allow either reciprocal axial engagement or disengagement, and wherein said conversion means comprises an electromagnetic multipolar inductor device having elementary stator circuit means of which a portion of each is constituted by an angular segment of said nut on the threaded wall of the bore of which said screw is capable of rolling, thereby determining an axial driving force under the combined effect of the rotating magnetic adherence and of the mechanical stress imposed by the tangential cooperation of the threads of the screw and nut.

4,482,829

BRUSHLESS ELECTRIC MICROMOTOR

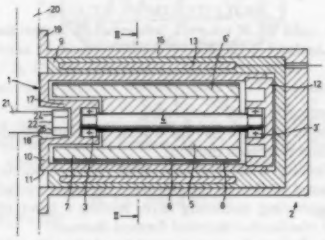
Pierre R. Tardieu, Chateauneuf-sur-Sarthe, and Yves H. Mulet-Marquis, Le Lion d'Angers, both of France, assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 8, 1982, Ser. No. 433,526

Claims priority, application France, Oct. 8, 1981, 81 18980

Int. Cl.³ H02K *49/02*

U.S. Cl. 310—105 **10 Claims**



1. A brushless electric micromotor comprising a rotor having a shaft, a tube-like member of a magnetic material on said shaft and permanent magnets mounted on said tube-like member, said shaft, said tube-like member and said magnets being rotatably mounted in a hermetically sealed in a rotor housing, said shaft being supported at its opposite ends in bearings mounted in said housing, said permanent magnets having outer surfaces coated with a layer of an electrically conductive metal, said permanent magnets extending beyond one of the ends of said shaft and the bearing supporting said shaft end and forming a magnetic drive for a second shaft magnetically coupled thereto and a stator unit co-axially surrounding said rotor housing, said stator unit having a housing of magnetic material and field winding coils in said magnetic material stator housing arranged regularly in said stator housing coaxially around said rotor with equal angular distances between said coils, said coils being embedded in insulating material, the hermetically sealed rotor housing being provided with a recessed end forming an axial, cylindrical cavity facing to the outside, and the end of said permanent magnets extend into a recess formed inside of said rotor housing by said recessed end and the outside wall of said housing, said end of said permanent magnets extending into said sleeve forming one part of a magnetic coupling for transmitting the torque of said rotor to said second shaft having a magnetic coupling counterpart.

4,482,830

ELECTRIC GENERATOR FOR VEHICLE

Yoshiyuki Iwaki, and Akio Matsumoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

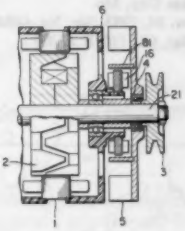
PCT No. PCT/JP82/00340, § 371 Date Apr. 7, 1983, § 102(e) Date Apr. 7, 1983, PCT Pub. No. WO83/00955, PCT Pub. Date Mar. 17, 1983

PCT Filed Aug. 26, 1982, Ser. No. 491,969

Claims priority, application Japan, Aug. 28, 1981, 56-136470; Aug. 31, 1981, 56-137335; Aug. 31, 1981, 56-137336

Int. Cl.³ H02K *9/06, 47/24*

U.S. Cl. 310—113 **7 Claims**



1. An electric generator for a vehicle comprising:

a generator rotor and a generator stator around said rotor, said generator having a first number of poles and having AC output windings in said stator for producing an AC output usable for supplying power to a load outside the generator;

an electric motor consisting of a motor stator having a second number of poles smaller than one half said first number of poles and a motor rotor rotatably mounted relative to said motor stator and magnetically coupled thereto for being driven by energization of the stator, said motor stator being electrically connected to said output windings of said generator stator for receiving part of the AC output from said generator; and

a fan fixed to the motor rotor and directed for causing a cooling air flow to flow over the generator for cooling the generator.

4,482,831

MAGNETO ARRANGEMENT

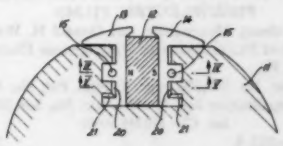
John A. Notaras, and Angelo L. Notaras, both of 15 Reynolds St., Balmain, New South Wales, 2041, Australia

Filed Mar. 29, 1983, Ser. No. 479,951

Claims priority, application Australia, Apr. 5, 1982, PF3484

Int. Cl.³ H02K *21/12*

U.S. Cl. 310—156 **7 Claims**



1. A magneto rotor assembly in which a magnet is maintained in position between a pair of pole pieces within a cavity in said rotor, said pole pieces are provided with two tapered surfaces and said cavity is provided with two corresponding tapered surfaces, one of said tapered surfaces extending in a radial direction to hold said pole pieces against outward move-

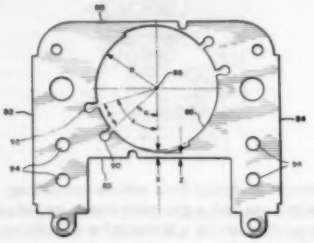
ment away from said magnet and the other of said tapered surfaces holding said pole pieces against radial movement each said pole piece and said rotor cavity tapered surfaces being mutually engagable to clamp said pole pieces against said magnet within said rotor wherein a fastener holds each pole piece in engagement with said rotor said two tapered surfaces having normals which are substantially mutually perpendicular and lie approximately in a plane and which is substantially perpendicular to the longitudinal axis of said fastener.

4,482,832

SHADED POLE MOTOR LAMINATION

Paul Minton, Litchfield, Minn., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed Mar. 31, 1983, Ser. No. 480,846
Int. Cl.³ H02K *17/00*
U.S. Cl. 310—216 **20 Claims**



16. A lamination for a shaded pole motor comprising a rotor, a main coil, and a plurality of shading coils, said lamination comprising:

a plate;

means, included in the plate, for defining a rotor opening having a selected radius R with respect to a center M;

means, included in the plate, for defining a reluctance gap in communication with the rotor opening, said reluctance gap defining an index point;

means, included in the plate, for defining first and second shading coil recesses grouped with the reluctance gap and in communication with the rotor opening;

said first and second shading coil recesses positioned with respect to the reluctance gap such that the angle with respect to the center M between the first recess and the index point is equal to a, the angle with respect to the center M between the second recess and the index point is equal to c, and the ratio c/a is in the range of about 1.60 to about 1.80.

4,482,833

METHOD FOR OBTAINING ORIENTED GOLD AND PIEZOELECTRIC FILMS

Robert W. Weinert, Monroeville, and Donald H. Watt, Turtle Creek, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 249,805, Apr. 1, 1981, Pat. No. 4,428,808. This application Jan. 4, 1984, Ser. No. 568,309
Int. Cl.³ H03H *9/40*
U.S. Cl. 310—313 A **10 Claims**

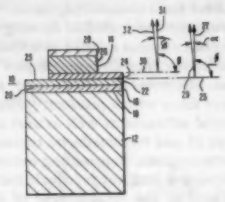
1. A transducer for generating acoustic waves in response to electrical signals in a substrate having a surface which does not orient gold comprising:

a first layer of glass deposited over said surface of said material,

a second layer of gold deposited over said second layer,

a third layer of piezoelectric material deposited over said second layer,

a fourth layer of conductive material formed over said third layer, and



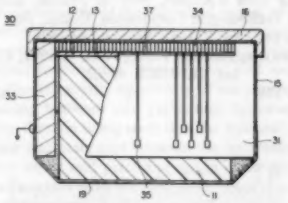
means for coupling an electrical signal between said second and fourth layers.

4,482,834

ACOUSTIC IMAGING TRANSDUCER

J. Fleming Dias; H. Edward Karrer; John D. Larson, III; David A. Wilson, all of Palo Alto, Calif., and Amin M. Hanafy, Andover, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 28, 1979, Ser. No. 52,705
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—327 **14 Claims**



1. An acoustic stack comprising:

an acoustic absorber having at least one bonding surface for bonding materials thereto;

strengthening a layer of insulating material bonded to the prepared surface of the absorber, the other surface of said strengthening insulating layer having a layer of electrically conductive material formed thereon;

a layer of piezoelectric material bonded to the electrically conductive material formed on the strengthening insulating layer, said layer of piezoelectric material having layers of electrically conductive material formed on both surfaces thereof;

a layer of electrically conductive material bonded to the other surface of the piezoelectric material; and

a layer of material closely matching the acoustic impedance of the human body covering the third layer of electrically conductive material.

4,482,835

MULTIPHASE BACKING MATERIALS FOR PIEZOELECTRIC BROADBAND TRANSDUCERS

Yoseph Bar-Cohen, Dayton; David A. Stubbs, Waynesville, and Wally C. Hoppe, Huber Heights, all of Ohio, assignors to Systems Research Laboratories, Inc., Dayton, Ohio

Filed May 9, 1983, Ser. No. 493,099
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—327 **7 Claims**

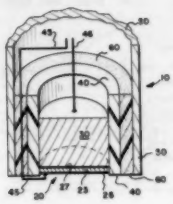
1. In an acoustical transducer comprising

a piezoelectric crystal having an electrically conductive surface plated thereon,

an absorbant backing material placed against one surface of said crystal for dampening the oscillations thereof, and

a housing for supporting the crystal and backing material, the improvement characterized by

said backing material comprising a mixture of low melting point metal powder having a low acoustical impedance relative to said crystal to form a matrix into which is



evenly distributed one or more metallic powders having a relatively high acoustical impedance, one of which is tungsten, said mixture formed into a cohesive solid having an acoustical impedance precisely matching the impedance of said crystal.

4,482,836

ELECTRON MULTIPLIERS

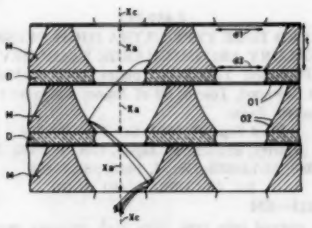
Derek Washington, E. Grinstead; Hewson N. G. King, Redhill, and Pamela M. Stubberfield, Croydon, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 748,699, Dec. 8, 1976, abandoned, which is a continuation of Ser. No. 598,234, Jul. 23, 1975, abandoned, which is a continuation of Ser. No. 456,374, Mar. 29, 1974, abandoned. This application Oct. 17, 1979, Ser. No. 85,580

Claims priority, application United Kingdom, Apr. 6, 1973, 16541/73

Int. Cl.³ H01J *43/00*

U.S. Cl. 313—104 **6 Claims**



1. In a channel plate electron multiplier of the laminated discrete dynode type wherein conductive sheets are stacked in closely spaced relation, said sheets having apertures with inner surfaces which are conductive and secondary-emissive, said apertures being aligned to form electron multiplying channels, an improved profile for said apertures comprising an input cross-section and an output cross-section which are approximately the same and a concavely shaped inner surface profile so that the majority of electrons tend to strike said inner surface close to the output end of said apertures and the gain of the multiplier is increased.

4,482,837

ROTARY ANODE FOR AN X-RAY TUBE AND A METHOD FOR MANUFACTURING THE SAME

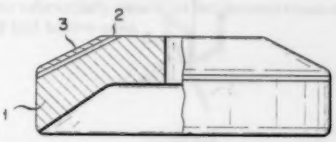
Hideo Koizumi, Tokyo; Isamu Koseki, Yokosuka; Tadashi Morita, Kawasaki; Shu Yamazaki, and Yoshio Fukuhara, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 252,192, Apr. 8, 1981, abandoned. This application Jul. 15, 1983, Ser. No. 513,955

Claims priority, application Japan, Apr. 11, 1980, 55-46726; Feb. 18, 1981, 56-21499

Int. Cl.³ H01J *35/08*

U.S. Cl. 378—144 **3 Claims**



1. A rotary anode for an X-ray tube comprising:

an anode body formed of graphite;

a preformed sheet formed of rhenium having a thickness of 15 to 200 μm and bonded to the top surface of said anode body; and

a target layer formed of tungsten or an alloy thereof and bonded to the top surface of said preformed sheet by a bonding agent incorporating rhenium paste.

4,482,838

THERMIONIC EMISSION CATHODE

Masaji Ishii; Hirotoshi Hagiwara, and Hideo Hiraoka, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1981, Ser. No. 327,467

Claims priority, application Japan, Dec. 9, 1980, 55-173415

Int. Cl.³ H01J *1/16, 19/10*

U.S. Cl. 313—336 **4 Claims**

1. A thermionic emission cathode of a single crystal made of calcium hexaboride type crystalline structure which comprises a top surrounded by natural faces inherent to the axial direction of the single crystal said cathode being thermodynamically stable and said faces being formed by chemical etching or by treatment under heat-evaporation in vacuum.

4,482,839

THERMIONIC EMISSION CATHODE AND PREPARATION THEREOF

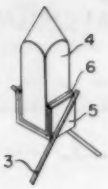
Tetsuya Wada; Masaji Ishii; Akira Miyai, and Hirotoshi Hagiwara, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,078

Claims priority, application Japan, May 29, 1981, 82049

Int. Cl.³ H01J *1/14, 19/06;* **H01K** *1/04*

U.S. Cl. 313—346 R **7 Claims**



1. A thermionic emission cathode which comprises a cathode tip made of an alkaline earth metal or rare earth metal hexaboride, a metallic support for the cathode tip to mechanically hold the base portion of said cathode tip and a bonding layer comprising colloidal carbon and a reaction barrier material which bonds said cathode tip and said metallic support in one body.

4,482,840

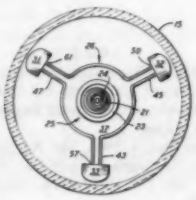
CRT CATHODE ASSEMBLY WITH SUPPORT MEANS

Floyd K. Collins, Seneca Falls, and Donald L. Say, Waterloo, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,118

Int. Cl.³ H01J *29/04*

U.S. Cl. 313—446 **6 Claims**



1. In a CRT single gun structure formed of sequentially arranged electrode elements integrated by a plurality of longitudinal support rods, a cathode assembly oriented in spatial relationship with the control electrode component of said gun structure, the cathode assembly including support means, a cathode eyelet and a cathode, said support means comprising:

a substantially annular disc-like metallic member having alpha and beta substantially planar surfaces with a central opening therethrough dimensioned to accommodate the positioning and attachment of said cathode eyelet therein, said member having a peripheral rim extending from one of said surfaces, said disc-like member having at least two integral positioning leg elements of U-shaped cross section extending substantially radially from said rim, said U-shaped elements having sides formed as extensions of said rim, the apex portion of the exterior surface of each U-shaped element being in the plane of the surface of said support member opposite the surface from which the rim extends.

4,482,841

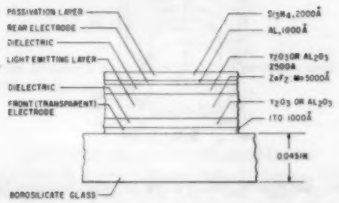
COMPOSITE DIELECTRICS FOR LOW VOLTAGE ELECTROLUMINESCENT DISPLAYS

Shiban K. Tiku, and Milo R. Johnson, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 2, 1982, Ser. No. 353,991

Int. Cl.³ H01J *1/70*

U.S. Cl. 313—503 **11 Claims**



1. A thin film electroluminescent display, comprising:

an active phosphor layer;

first and second dielectric layers, adjacent to said phosphor layer and on opposite sides thereof;

first and second conductor layers respectively adjacent to said first and second dielectric layers and not in contact with said phosphor layer;

a substrate adjacent to said first conductor layer; and

an encapsulation layer adjacent to said second conductor layer;

wherein at least one of said dielectric layers consists essentially of a uniform mixture of a first dielectric material and a second dielectric material, said first dielectric material having a dielectric constant which is more than twice the dielectric constant of said phosphor, and said second dielectric material having a dielectric loss less than said phosphor.

4,482,842

CURVED TUBE TYPE ULTRA HIGH PRESSURE MERCURY ARC DISCHARGE LAMP DEVICE

Takashi Fujimura; Yoshifumi Tomita, both of Mobara, and Kiyoshi Sawatari, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,714

Claims priority, application Japan, Oct. 1, 1980, 55-135886; Oct. 1, 1980, 55-135888; Oct. 1, 1980, 55-135890

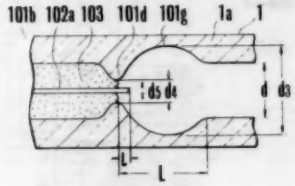
Int. Cl.³ H01J *61/30, 61/20*

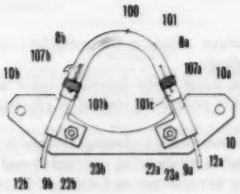
U.S. Cl. 313—634 **10 Claims**

1. In a curved tube type ultra high pressure mercury discharge lamp device of the type comprising an arcuate glass tube, a quantity of mercury contained in both ends of said glass tube, and electrodes projecting into said glass tube beyond surfaces of said mercury for creating electric discharge between said electrodes, the improvement which comprises throttles formed on an inner surface of said glass tube near said electrodes, said throttles having inner diameters smaller than an inner diameter of said glass tube and said mercury being contained in spaces between said throttles and said both ends of said glass tube and recesses on the internal side of said nozzles, said recesses having larger diameters than the inner diameter of said glass tube wherein an inner diameter d4 of said throttles

and a diameter d5 of said electrodes are selected to satisfy the following relation

$$2d5 < d4 < 3d5$$





wherein length of said electrodes projecting from the surfaces of said memory is selected to be 0.7 to 1.0 mm when the lamp is not operated.

4,482,843

GYROTRON DEVICE

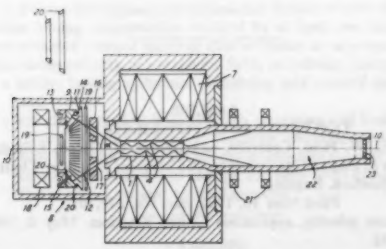
Dudley Perring, Charvil, England, assignor to Thorn EMI-Varian Limited, Hayes, England

Filed Feb. 5, 1982, Ser. No. 346,201

Claims priority, application United Kingdom, Feb. 10, 1981, 8104066

Int. Cl.³ H01J *25/00*

U.S. Cl. 315—4 **7 Claims**



1. A gyrotron device comprising,

a waveguide, circular in cross-section, which is dimensioned to accommodate a predetermined transverse electric mode and to operate as an interaction region at a predetermined radio frequency,

means for generating a magnetic field having field lines which, in said interaction region, are parallel to the axis of the waveguide and is of a strength sufficient to cause electrons, introduced into the interaction region, to gyrate at a predetermined cyclotron frequency (ω_c),

injection means for introducing electrons into said interaction region, the injection means comprising a thermionic cathode for producing a beam of electrons in the form of a hollow cone which is centred on said axis and intersects said parallel field lines at a preset angle, and wherein each electron follows a linear trajectory from said cathode to the interaction region said angle being chosen to establish a preset component of velocity for said beam perpendicular to the axis of the waveguide, sufficient to cause electrons in the beam to gyrate as a result of their interaction with the parallel field lines at the cyclotron frequency and a preset component of velocity parallel to the axis of the waveguide sufficient to produce a plurality of cycles of the beam in the waveguide,

and means for modifying the magnetic field prevailing in the vicinity of the hollow cone to constrain the field lines to run substantially parallel to the electron beam in the form of said hollow cone.

4,482,844

LAMP DIMMER

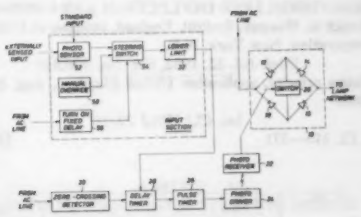
Carl Schweer, Petersborough, and R. Carl Rath, Putnam, both of Canada, assignors to Wide-Lite International Corporation, San Marcos, Tex.

Filed Feb. 7, 1983, Ser. No. 464,405

Claims priority, application Canada, Feb. 17, 1982, 396452

Int. Cl.³ G05F *1/00*

U.S. Cl. 315—194 **11 Claims**



1. A lamp dimmer for connection to at least one lamp circuit for interrupting a portion of each positive and negative half cycle of applied distribution line current to the lamp circuit, comprising

diode routing means connected to the distribution line and to the lamp circuit for providing line voltage to the lamp circuit,

an electronic switch connected to provide means for interrupting voltage through said diode routing means,

a photocontroller including a photocontrol driver and a photocontrol receiver for operating said electronic switch,

an automatically adjustable pulse timer for pulse operating said photocontrol driver, the output therefrom being adjustable with respect to pulse width within the first part of each half cycle of applied line voltage as dependent on the location of the onset of the timer operation,

a delay timer connected to said pulse timer for determining the onset of timer operation of said photocontrol driver,

a zero-crossing detector for producing an output with each line voltage zero-crossing and connected to said delay timer, and

input means for determining the amount of dimming, said input means being connected to said delay timer, the level output determining the output of said delay timer with respect to said zero-crossing output of said detector.

4,482,845

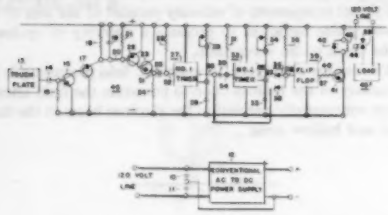
PROCESS FOR PREVENTING INADVERTENT ACTUATION OF CONTROLS

William H. Roylance, 1654 Redondo Ave., Salt Lake City, Utah 84105, and Byron D. Roylance, Salt Lake City, Utah, assignors to William H. Roylance, Salt Lake City, Utah

Filed Sep. 30, 1982, Ser. No. 429,067

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—360 **12 Claims**



1. A light fixture consisting of a support; at least one source of illumination attached to the support; means controlling the illumination; and means for actuating the illumination control when a physical object is placed in proximity to the light fixture a plurality of times within a predesignated time period.

4,482,846

TELEVISION LINE DEFLECTION ARRANGEMENT

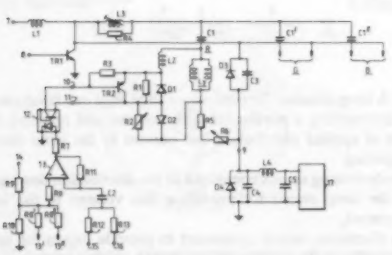
Frederick E. Worster, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,839

Claims priority, application United Kingdom, Aug. 14, 1981, 8124869

Int. Cl.³ H01J *29/56*

U.S. Cl. 315—371 **13 Claims**



1. In a line deflection arrangement for television display apparatus, said arrangement comprising a line deflection coil, means for producing a line deflection current of substantially sawtooth shape through said line deflection coil, means for producing a static magnetic bias in the direction of the deflection magnetic field produced by said line deflection the deflection magnetic field produced by said line deflection coil when energized by said line deflection current, the improvement comprising a series arrangement of a current limiter and a first unidirectional current conducting element, said series arrangement being connected in parallel with said line deflection coil, a variable impedance connected in parallel with said element, means varying said impedance over a field period to cause said deflection coil to produce a magnetic bias in said direction which varies dynamically over said field period, said dynamic magnetic bias being superimposed on said static magnetic bias.

4,482,847

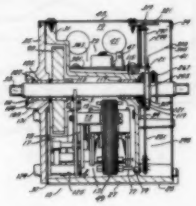
ELECTRICALLY-CONTROLLED ROTARY ACTUATOR

George Rudich, Jr.; Charles F. Beeson, both of Goshen, and Gary L. Bartley, Elkhart, all of Ind., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Feb. 25, 1983, Ser. No. 469,929

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—9 **10 Claims**



1. A motor-driven actuator for providing rotary output torque and including:

a single electric drive motor having a stator adapted to be configured for providing one of a plurality of output torques;

power transmission means including a rotatable output shaft, said transmission means being coupled to said drive motor and including drive elements formed of disparate materials selected for transmitting one of said output torques, and;

electric control means coupled to said motor for providing continuous rotation positioning control of said output shaft in response to externally generated analog command signals received at said control means;

said electric control means including a first control circuit having means for generating a feedback signal representative of the actual angular position of said output shaft and a second control circuit responsive to said command signals, said second control circuit including signal shift circuit means for selectively converting an externally generated first input voltage signal received at said control means and occurring within a predetermined first range to an internally generated second input voltage occurring within a predetermined second range.

4,482,848

CONTROLLABLE POWER SOURCE

John C. W. Heal, Coalville, and George G. Dixon, Evington, both of England, assignors to The Marconi Company Limited, Chelmsford, England

Filed May 10, 1982, Ser. No. 376,701

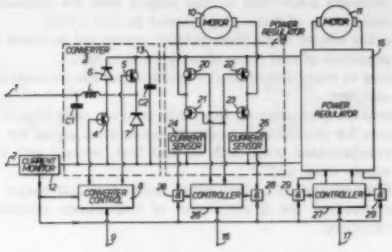
Claims priority, application United Kingdom, May 8, 1981, 8114143

Int. Cl.³ H02M *1/14*

U.S. Cl. 318—98 **8 Claims**

1. A controllable power source including voltage converter means, having a converter input port and a converter output port that is different from said converter input port, for receiving an applied d.c. voltage at the converter input port and producing from it a higher a.c. or d.c. voltage at the converter output port; a power regulator having a regulator input port connected to the converter output port to receive the higher voltage and having a regulator output port for providing a controlled power level; and converter control means connected to said converter means for controlling the value of said

higher voltage in accordance with a predetermined characteristic so that the high voltage value and the current provided by



said regulator output port result in a product having a predetermined maximum.

4,482,849

METHOD AND DEVICE FOR ALIGNMENT OF A BRUSHLESS D.C. MOTOR

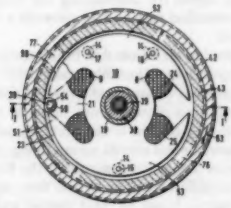
Benno Doemen, and Rolf Müller, both of St. Georgen, Fed. Rep. of Germany, assignors to Papst-Motoren GmBH & Co., K.G., St. Georgen, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 361,059

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3111387

Int. Cl.³ H02K *23/00*

U.S. Cl. 318—254 **14 Claims**



9. Device for aligning a brushless d.c. motor of even number pulses having commutation control by at least one magnetic flux-sensitive control member that switches in response to an alternating polarity of a magnetic field, said device comprising:

a holder having a channel containing said control member; and

a second channel at least partially receiving and holding in close proximity thereto at the same circumferential location in the motor an additional permanent magnet source of constant polarity to change the zero level of resulting fluxes acting on said control member.

4,482,850

CONTROL CIRCUIT FOR DC CAPSTAN MOTOR

Masakazu Sonoda; Takashi Terajima, both of Urawa, and Minoru Ozawa, Kokubunji, all of Japan, assignors to Sony Corporation, Tokyo, Japan

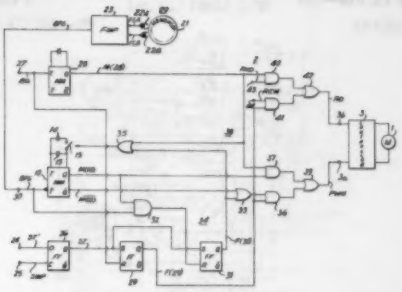
Filed Sep. 24, 1982, Ser. No. 422,566

Claims priority, application Japan, Sep. 25, 1981, 56-151635

Int. Cl.³ H02P *3/10*

U.S. Cl. 318—606 **14 Claims**

1. A control circuit for a DC capstan motor for intermittently driving a tape in a tape device, comprising a frequency signal generator associated with said capstan motor for generating a frequency signal whose frequency varies with rotational speed of the motor; means generating a drive pulse signal for moving said tape intermittently; means generating a brake pulse signal alternating with said drive pulse signal for halting the intermittent movement of said tape; drive circuit means supplied with said frequency signal, said drive pulse signal, and said brake pulse signal for providing a pulse-width modulated (PWM) signal having a duty ratio that changes with the frequency of said frequency signal such that, during said drive pulse signal, said duty ratio decreases with increases in said rotational speed and, during said brake pulse signal, said duty ratio decreases with decreases in said rotational speed; and controller means supplied with said PWM signal for correspondingly supplying drive current to said DC motor for intermittently advancing said tape.



4,482,851

CONTROL CIRCUIT FOR STEPPING MOTOR

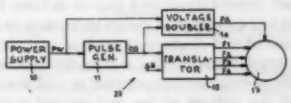
Giuseppe Cantello, S. Giusto Can., Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Dec. 29, 1982, Ser. No. 454,287

Claims priority, application Italy, Dec. 30, 1981, 68708 A/81

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **9 Claims**



1. In a control circuit for a stepping motor having a plurality of excitable windings, said circuit comprising a power supply unit for generating a direct current voltage, switching means interposed between said power supply unit and said plurality of excitable windings and selectively actuatable for coupling said power supply unit to said plurality of excitable windings, a timing pulse generator for generating timing pulses, a translator connected to said timing pulse generator for generating a series of sequential logical signals for actuating said switching means and causing the excitation of said plurality of windings, the improvement wherein a voltage multiplier is connected to said power supply unit, to said timing pulse generator and to said plurality of windings for selectively multiplying said direct current voltage at each beginning of excitation of each one of said windings.

4,482,852

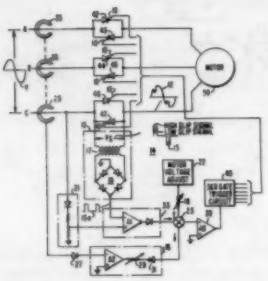
MOTOR SLIP CONTROLLER FOR AC MOTORS

Nicholas G. Muskovac, Palm Harbor, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 276,765, Jun. 24, 1981, abandoned. This application Jun. 7, 1983, Ser. No. 500,798

Int. Cl.³ H02P 5/40

U.S. Cl. 318—729 **1 Claim**



1. Energy saving control apparatus for a constant-frequency AC induction motor, comprising:

control means comprising an electronic switch having a control terminal and a pair of output terminals connected in series circuit relationship with a motor being controlled thereby and a source of AC power;

sensing means interconnected with both of said output terminals for generating a sense signal proportional to the amplitude of the voltage across said control means; and

feedback means responsive solely to the amplitude of current and voltage levels in said apparatus, said feedback means being interconnected with said sensing means to receive said sense signal therefrom, said feedback means being interconnected with said control means at said control terminal thereof, said feedback means comprising a line voltage reference means for generating a line voltage signal proportional to the amplitude of the voltage of the AC power and for subtracting said sense signal from said line voltage reference signal to produce a feedback control signal for being applied to said control terminal, said feedback means also comprising current means for generating a current signal proportional to the amplitude of current flow through the motor being controlled, said feedback means incorporating said current signal into said feedback control signal such that an increase in the amplitude of said current flow causes an increase in the conduction time of said electronic switch of said control means, said control means utilizing said feedback control signal to vary the average voltage supplied to said motor as a function of the voltage across said control means and the current through said motor.

4,482,853

COMPOSITE CONTROL FOR SOFT START AND DYNAMIC BRAKING OF A THREE-PHASE INDUCTION MOTOR

Manubhai R. Bhavsar, Ontario, Calif., assignor to Reuland Electric Company, Industry, Calif.

Filed Aug. 24, 1981, Ser. No. 295,489

Int. Cl.³ H02P 1/28, 3/24

U.S. Cl. 318—778 **12 Claims**

1. A soft start control circuit for a three phase induction motor conveniently modifiable so as to provide a dynamic braking function comprising:

a source of three phase power having a first, second and third supply line;

a selector circuit providing for operator selection of RUN and BRAKE modes;

a three phase voltage controller having silicon controlled rectifiers connected in said supply lines for connecting said source of three phase power to said motor;

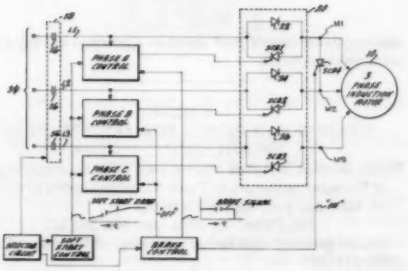
another silicon controlled rectifier connected between two terminals of said three phase induction motor;

means to control the firing of said another silicon controlled rectifier;

means for providing an adjustable positive ramp signal;

means for providing a sawtooth wave form signal for and synchronized with each of said first, second and third supply lines; and

a first, second and third phase control circuit means for controlling the firing angles of said silicon controlled rectifiers;



said first, second and third phase control circuit means being responsive to said positive ramp signal and said sawtooth waveform signal for controlling the firing angles of said silicon controlled rectifiers to provide a soft start for said motor; and

means to provide an adjustable brake torque signal;

means to provide an adjustable brake timer signal determining the duration of said brake torque signal;

means to provide a second timer signal to become active at the termination of said brake timer signal;

said first phase control circuit means being responsive to said brake torque signal for controlling the firing angle of said silicon controlled rectifier in said first supply line to provide a dynamic brake for said motor; and

means responsive to said second timer signal to discontinue said supply of three phase power on said first, second and third supply lines.

4,482,854

INVERTER CIRCUIT

Shigeki Kawada, Hino; Hiroshi Ishida, Hamura, and Shinichi Kouno, Hino, all of Japan, assignors to Fanuc Ltd., Tokyo, Japan

Filed Oct. 6, 1982, Ser. No. 433,103

Claims priority, application Japan, Oct. 9, 1981, 56-161239

Int. Cl.³ H02H 7/122

U.S. Cl. 318—801 **5 Claims**

1. An inverter circuit connectable to a DC voltage generating unit having output terminals, and to a bridge circuit, having input terminals and a plurality of switching elements connected in the form of a bridge, for receiving a DC voltage from said DC voltage generating unit and for converting into an alternating current, The received DC voltage, said inverter circuit comprising:

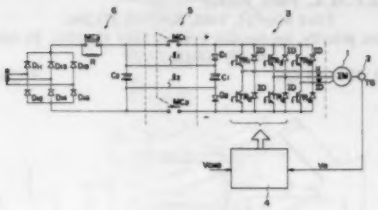
first switching means for connecting said bridge circuit input terminals to said DC voltage generating circuit output terminals when said first switching means is closed to begin operation of said inverter circuit;

a series network including

a pair of diodes connected so as to be forward biased with respect to the DC voltage, and

a spike absorbing capacitor connected between said diodes,

said series network being connected to the input terminals of



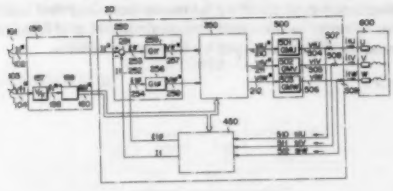
said bridge circuit, said spike absorbing capacitor having both ends thereof connected, for DC current, to the output terminals of said DC voltage generating unit prior to closure of said first switching means.

4,482,855

CURRENT CONTROL APPARATUS FOR ELECTRIC POWER SYSTEMS

Kenichi Otsuka, Hamakita, and Takeo Shimamura, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 17, 1983, Ser. No. 495,474
Claims priority, application Japan, May 26, 1982, 57-89168
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—809 **11 Claims**



1. A current control apparatus for electric power systems, comprising:

first means for providing a DC amplitude instruction and an AC phase instruction;

second means responsive to voltage instructions for supplying a load with AC load currents;

third means coupled to said first and second means for generating a DC phase error signal according to the phase difference between a phase angle of a composed vector of said AC load currents and that of said AC phase instruction, and for generating a DC amplitude signal according to the sum of the square of a cosine component of said AC load currents and the square of a sine component of said AC load currents;

fourth means coupled to said first and third means for generating a first voltage instruction which corresponds to the difference between said DC amplitude instruction and said DC amplitude signal, and for generating a second voltage instruction which corresponds to said DC phase error signal; and

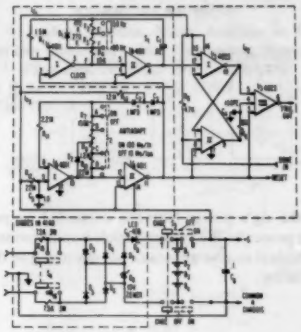
fifth means coupled to said second and fourth means for generating said voltage instructions according to said first and second voltage instructions.

4,482,856

BATTERY CHARGER

Paul L. Meretsky, Haifa, Israel, assignor to Technion Research and Development Foundation, Ltd., Haifa, Israel

Continuation-in-part of Ser. No. 219,332, Dec. 17, 1980, abandoned, which is a division of Ser. No. 921,344, Jul. 3, 1978, Pat. No. 4,256,116. This application Jul. 7, 1982, Ser. No. 396,056
Int. Cl.³ H02J *7/00*
U.S. Cl. 320—59 **12 Claims**



1. A transformerless battery charger comprising a bridge assembly having a plurality of diodes arranged in a bridge, said bridge assembly having means to permit batteries to be charged to be connected thereto, a zener diode assembly across the output of said bridge assembly, means connecting the bridge assembly to a charging voltage source, means to limit the flow of current from said charging voltage source into said bridge assembly, said zener diode assembly breakdown voltage being greater than the battery voltage, and the bridge diode assembly voltage rating being greater than the zener diode breakdown voltage; said current limiting means between said source and said bridge and said voltage relationships between said bridge, said zener diode and said batteries being such as to permit direct use of relatively large voltages at said source without the intervention of a transformer while using diodes in said bridge of relatively low ratings and of relatively low cost; and said battery charger being so arranged that the output of said diode bridge is absorbed by said zener diode when said batteries to be charged are disconnected from said diode bridge.

4,482,857

CLOSED LOOP POWER FACTOR CONTROL FOR DRILLING RIGS

Michael N. Porche, Houston, and Louis G. Beauregard, Stafford, both of Tex., assignors to Rig Efficiency, Inc., Houston, Tex.

Filed Aug. 8, 1983, Ser. No. 521,119
Int. Cl.³ H02J *3/18*
U.S. Cl. 323—205 **20 Claims**

4. In a drilling rig having a plurality of engine-generator sets which form an alternating current power supply system for operating the rig's electrical equipment and machinery, a method for controlling the system power factor comprising:

sensing the instantaneous power factor of each engine-generator set;

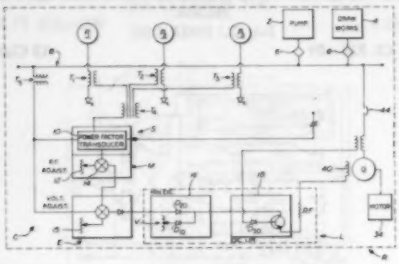
comparing the sensed power factor from each engine-generator set to a prescribed power factor;

forming a power factor control signal for each engine-generator set indicative of the difference between the sensed instantaneous power factors and the prescribed power factor;

providing a field excitation signal to a reactive power gener-

ator proportionate to the power factor control signal which is indicative of the largest differential between sensed power factor and prescribed power factor;

coupling the output of the reactive power generator to the rig power system;



whereby the rig's power factor is corrected by providing reactive power to the system which is required to correct the individual engine-generator set operating at the worst power factor.

4,482,858

APPARATUS FOR AND A METHOD OF TESTING DETONATING SYSTEMS

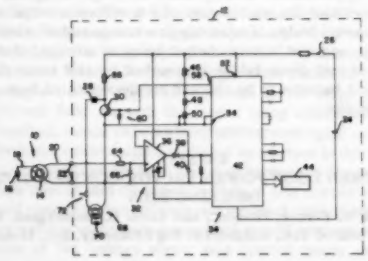
Bohumil M. J. Plichta, Kempton Park, South Africa, assignor to AECI Limited, Johannesburg, South Africa

Filed Mar. 19, 1982, Ser. No. 359,893

Claims priority, application South Africa, Mar. 27, 1981, 81/2074

Int. Cl.³ G01R *27/00*

U.S. Cl. 324—57 Q **31 Claims**



1. Apparatus for impulse testing of a first reactive element having a resistive component R to be measured, said apparatus comprising:

a second reactive element means for storing a calibrated energy value from a power supply;

switch means for releasing said calibrated energy from said second reactive element means into said first reactive element so as to obtain an overdamped or non-oscillatory response of the second order; and

measurement means for effecting a single reading of a single peak value of said second order response and for extracting the value of said resistive component R from said calibrated energy value and from said single reading of a peak value of said second order response.

4,482,859

OBJECT DISPLACEMENT SENSOR AND DEVICE FOR MEASURING THE ROTATION SPEED AND VIBRATION FREQUENCY OF A ROTOR

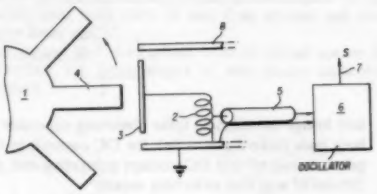
Jacques M. A. Fournier, Chatillon, France, assignor to S.N.E.C.M.A., Paris, France

Filed May 14, 1982, Ser. No. 378,346

Claims priority, application France, May 15, 1981, 81 09681

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 QS **9 Claims**



1. An object displacement sensor comprising:

a resonant circuit having at least one inductive element and a condensor with one of the plates of said condensor being made up of a conductive surface and the other plate being successively formed by each one of a plurality of objects passing close to said surface;

a first oscillator connected to said resonant circuit for determining a functioning frequency such that the signal issued from said first oscillator is modulated by the frequency with which said objects pass said surface;

frequency discriminator means comprising a second oscillator controlled by a phase loop consisting of a first multiplier circuit and a first integrator with the reference input of said first multiplier circuit being supplied with the frequency modulated signal issued from said first oscillator in order to provide a demodulation of said frequency modulation signal issued by said first oscillator.

4,482,860

CAPACITANCE MEASUREMENT PROBE

Donald G. Risko, Monroeville, Pa., assignor to Extrude Hone Corporation, Irwin, Pa.

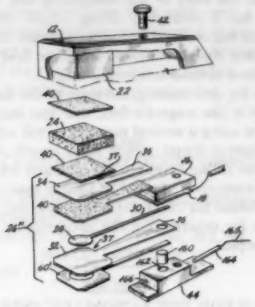
Continuation-in-part of Ser. No. 329,943, Dec. 11, 1981, Pat. No. 4,422,035, which is a continuation-in-part of Ser. No. 215,737, Dec. 12, 1980, abandoned. This application Apr. 19, 1983, Ser. No. 486,807

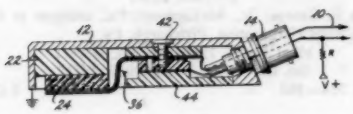
Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 P **15 Claims**

1. In a method of gauging a predetermined characteristic of an electrically conductive surface by spacing an active sensor area a predetermined distance from an incremental area of said conductive surface and capacitively coupling said active sensor area and said incremental area for said gauging, wherein at least a portion of an electrically conductive material comprises said active sensor area and wherein said incremental area is determined by said active sensor area and provides a gauging

capacitance in accordance with said surface characteristic, the improvement comprising the steps of:





electrically sensing when said predetermined distance is attained; and

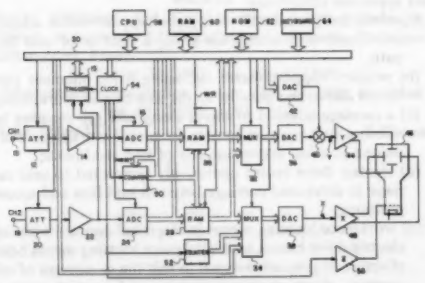
commensing said gauging only in response to said sensing.

4,482,861

WAVEFORM MEASUREMENT AND DISPLAY APPARATUS

Lee J. Jalovec, Beaverton, and Roland E. Andrews, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 14, 1982, Ser. No. 388,008
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 B **3 Claims**



1. A waveform measurement and display apparatus, comprising:

a first and second signal-processing channel, each including means for converting a respective electrical signal to digital representations thereof, digital memory means for storing said representations, and means for converting said representations to analog values for display;

means for selectively providing a Y-T display wherein at least one of said first and second signals is displayed along a time axis, and an X-Y display wherein said first signal is displayed along a first axis with respect to said second signal displayed along a second axis normal to said first axis; and

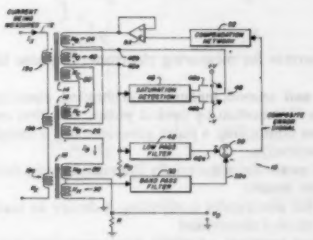
means for storing time marker data at predetermined address locations and producing time markers at corresponding time positions of said Y-T and X-Y displays.

4,482,862

CURRENT SENSOR

Jonathan R. Leehey, Malden, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jun. 10, 1982, Ser. No. 387,162
Int. Cl.³ G01R *33/00*
U.S. Cl. 324—117 R **6 Claims**



1. A system for measuring current in a conductor, comprising:

A. first, second, and third magnetic cores disposed about said conductor, and a plurality of windings associated with said cores,

wherein said first core is non-linear and is adapted for operation in and between its saturation ranges of its B-H characteristic, and has a bucking winding, a cancellation winding and a low frequency sensor winding wound thereabout,

wherein said second core is adapted for operation in a substantially non-saturating range of its B-H characteristic and has a bucking winding and a cancellation winding wound thereabout,

wherein said third core is adapted for operation in a substantially non-saturating range of its B-H characteristic and has a bucking winding and a high frequency sensor winding wound thereabout,

B. means for coupling said cancellation windings of said first and second cores in series in a closed loop,

C. means for coupling said bucking windings of said first, second, and third cores in series, and associated means for generating an output signal representative of the current in said bucking windings,

D. bandpass filter means coupled to said high frequency sensor winding for generating a first error signal representative of high frequency flux changes in said third core,

E. flux oscillator means coupled to said low frequency sensor winding for generating a second error signal representative of low frequency flux changes in said first core,

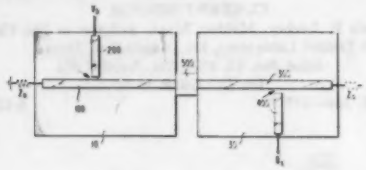
F. feedback means responsive to said first and second error signals for generating a bucking current representative of a combination of said first and second error signals, and means for coupling said bucking signal to said series connected bucking windings,

whereby the flux generated in said first, second and third cores from said bucking current substantially nulls flux generated in said first, second and third cores from said current-to-be-measured in said conductor and said output signal is representative of said current-to-be-measured.

4,482,863
APPARATUS AND METHOD FOR MEASURING ELECTRONIC RESPONSE OF HIGH SPEED DEVICES AND MATERIALS

David H. Auston, Mountainside, N.J., and Peter R. Smith, New York, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 14, 1981, Ser. No. 292,438
Int. Cl.³ G01R 31/26
U.S. Cl. 324—158 T 13 Claims



1. Apparatus for measuring electronic response times comprising:

a first and second means for generating electrical signals upon illumination by optical pulses, said first and second means comprising a pulse generator and a sampling gate, respectively;

optical means for sequentially illuminating said first and said second means;

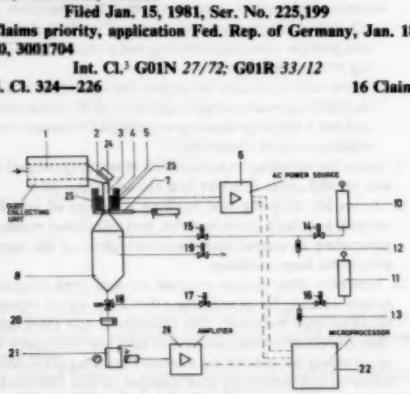
means for electrically connecting a device to said first and said second means; and

an output terminal adaptable for connection to means for analyzing the output from said device.

4,482,864
PROCESS AND EQUIPMENT FOR COLLECTING MAGNETITE-CONTAINING ORE DUST SAMPLES AND DETERMINING THE MAGNETITE AND PHOSPHOROUS CONTENTS THEREOF

Rainer Koenig, Eschborn; Rolf Sieglen, Sulzbach; Wolfgang Weisser, Bad Homburg, and Helga Heide, Kelkheim, all of Fed. Rep. of Germany, assignors to Luossavaara-Kiirunavaara AB, Stockholm, Sweden

Filed Jan. 15, 1981, Ser. No. 225,199
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1980, 3001704
Int. Cl.³ G01N 27/72; G01R 33/12
U.S. Cl. 324—226 16 Claims



7. Apparatus for the determination of the magnetite and phosphorous contents of a magnetite-containing ore comprising:

(a) means for collecting a sample of dust from the magnetite-containing ore and placing the magnetite-containing dust in a tube;

(b) means for determining the magnetite content of the dust sample from changes in the magnetic flux thereof, said magnetite content determination using a coil system which includes at least a first measuring coil adapted to generate an output signal for determining the magnetite content, the core of the measuring coil forming a tube which has a minimum filling height that exceeds the length of the coil and including a means for receiving and processing signals received from the first measuring coil and from a second measuring coil;

(c) means for determining the mass of the dust sample from changes in the magnetic flux, said dust sample mass determination using a second measuring coil adapted to generate an output signal, which has a length that exceeds the maximum filling height of the tube and which is provided for determination of the dust sample mass to send a signal to the means for receiving and processing signals; and

(d) means for determining the phosphorous content of the dust sample.

4,482,865
APPARATUS FOR THE AUTOMATIC INDUCEMENT OF A MAGNETIC FIELD IN AN ELONGATED ARTICLE UNDER TEST

Kenneth E. George, Jr., McKeesport, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 4, 1982, Ser. No. 385,912
Int. Cl.³ G01N 27/84; G01R 33/12
U.S. Cl. 324—263 8 Claims

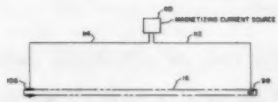
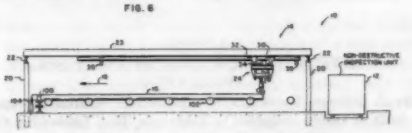


FIG. 6



1. Apparatus for magnetizing an elongated magnetizable workpiece which passes in a longitudinal flow path through said apparatus comprising:

(a) electrically insulated workpiece support means adapted to support said workpiece along a portion of said flow path;

(b) primary support means including a rail member positioned above and parallel to the axis of said workpiece;

(c) a carriage adapted to travel along said rail member between a first position remote from said workpiece and a second position above one end of said workpiece;

(d) electric drive means operatively connected to said carriage to drive said carriage between said first and second positions;

(e) workpiece locating means in electrical contact with said electric drive means, said workpiece locating means being effective to generate a signal to halt the movement of said carriage along said rail member when said carriage reaches said second position;

(f) first vertically displaceable support means affixed to said carriage, said vertically displaceable support means supporting said workpiece locating means and being effective to displace said workpiece locating means between one position effective to locate said one end of said workpiece and another position out of said flow path;

(g) a first electrical contact means;

(h) second vertically displaceable support means affixed to said first vertically displaceable support means, said second vertically displaceable support means supporting said first electrical contact means and being effective to displace said first electrical contact means between a position in operative contact with said workpiece and another position out of said flow path;

(i) second electrical contact means arranged with respect to the other end of said workpiece for movement between a position in operative contact with said workpiece and another position out of said flow path; and,

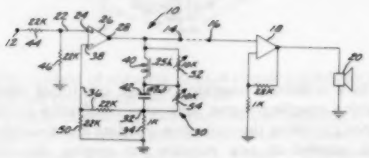
(j) source of magnetizing current adapted to cause a magnetizing current to pass in said workpiece between said first and second electrical contact means when each is in its respective electrical contact position.

4,482,866

REFERENCE LOAD AMPLIFIER CORRECTION SYSTEM

Robert C. Crooks, Huntington Beach, Calif., assignor to Barcus-Berry, Inc., Huntington Beach, Calif.

Filed Feb. 26, 1982, Ser. No. 352,794
Int. Cl.³ H03F 1/08
U.S. Cl. 330—149 **42 Claims**



1. A method of correcting for variations in a load driven by a power amplifier that has an input circuit line through which it receives a variable wave form input program voltage signal, which comprises:

applying said program signal to a reference load which has electrical characteristics that simulate characteristics of said driven load and using the response of said reference load to said program signal to develop a correction signal for said driven load, and

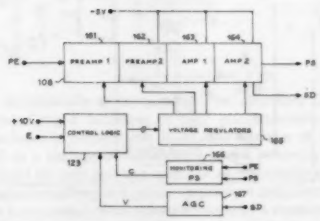
simultaneously applying said program signal and said correction signal to said power amplifier.

4,482,867

MICROWAVE POWER TRANSMITTER FOR DOPPLER RADAR

Maurice Marchand, and Yan Haentjens, both of Boulogne, France, assignors to LMT-Radio Professionnelle, Boulogne-Billan-court, France

Filed Aug. 31, 1982, Ser. No. 413,507
Claims priority, application France, Oct. 23, 1981, 81 19940
Int. Cl.³ H03F 3/60, 3/193
U.S. Cl. 330—277 **5 Claims**



1. A microwave power transmitter for Doppler radars, which comprises:

an amplifying chain formed by a plurality of stages in series provided with field effect transistors operating in Class A mode for amplifying a signal formed by a sequence of microwave pulses;

a plurality of voltage regulators for separately supplying at least each stage of the amplifying chain, each regulator having an input for receiving a reference voltage determining the output voltage of the regulator, and the inputs being joined together;

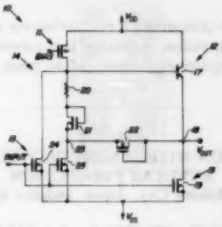
a control circuit comprising a Zener diode for supplying the said reference voltage, and means for supplying this Zener diode under the control of a digital signal in phase with the microwave pulses.

4,482,868

OUTPUT STAGE FOR A DRIVER CIRCUIT HAVING LOW QUIESCENT OUTPUT CURRENT

Roger A. Whatley, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 7, 1983, Ser. No. 472,516
Int. Cl.³ H03F 3/26, 3/16
U.S. Cl. 330—274 **8 Claims**



1. An output stage for a driver circuit which has a small amount of quiescent output current, comprising:

current source means for sourcing output current via an output terminal in proportion to an applied drive current;

current sink means for sinking output current via the output terminal in proportion to an input control voltage;

drive means coupled to said current source means for providing the drive current;

cross-over compensation means for biasing the current source means at least a predetermined bias voltage above the output terminal, comprising:

a first diode-connected device having a first current electrode coupled to both said drive means and said current source means, and a second current electrode; and

a second diode-connected device having a first current electrode coupled to the second current electrode of said first diode-connected device, and a second current electrode coupled to both said output terminal and said current sink means; and

shunt means, for shunting the drive current away from the current source means in response to the input control voltage, comprising:

first shunt means coupled in parallel with both the second diode-connected device and said current sink means; and

second shunt means coupled in parallel with said first and second diode-connected devices and with said current sink means.

4,482,869

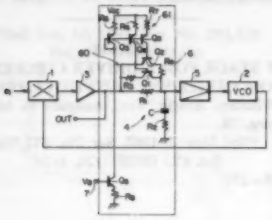
PLL DETECTION CIRCUIT HAVING DUAL BANDWIDTH LOOP FILTER

Hitoshi Hirata, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 13, 1982, Ser. No. 368,067
Int. Cl.³ H03L 7/10
U.S. Cl. 331—4 **5 Claims**

1. A PLL (phase locked loop) detection circuit, comprising: a loop filter comprising plural elements; a changeover circuit for switching a frequency response characteristic of said loop filter, and changeover circuit comprising a switching circuit including a pair of parallel-connected transistors, said switch-

ing circuit being connected across respective end terminals of a circuit which includes at least one of said plural loop filter elements; and actuating means for switching said pair of transistors in response to a predetermined control signal, said



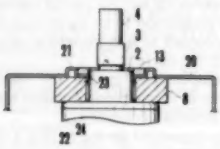
actuating means comprising a current mirror circuit having a two-stage configuration, outputs of said current mirror circuit stages being respectively connected to bases of said pair of transistors.

4,482,870

MAGNETRON WITH MAGNETIC YOKE HAVING ANNULAR PROJECTION

Masao Sakai, Mobara City, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1981, Ser. No. 312,245
Claims priority, application Japan, Oct. 24, 1980, 55-148306
Int. Cl.³ H01J *25/50*
U.S. Cl. 331—86 **1 Claim**



1. In a magnetron of the type comprising an anode cylinder containing an oscillator cavity;

a pair of cup shaped sealing members connected to the opposite ends of said anode cylinder for forming an evacuated vessel together with said anode cylinder;

one of said sealing members being connected to a load of said magnetron,

a pair of permanent magnets respectively surrounding said sealing members,

a magnetic yoke enclosing said permanent magnets for providing a magnetic flux passage therefor, and

a ring shaped electroconductive gasket member having a central aperture interposed between said one sealing member and said yoke;

the improvement which comprises an external annular projection provided on a portion of said yoke to form an annular recess with said one sealing member projecting through said recess for receiving said gasket member snugly fitted between said annular projection and said one sealing member;

a flat edge extending radially inwardly from said annular projection toward an outer periphery of said one cup shaped sealing member for supporting a bottom portion of said gasket member; and

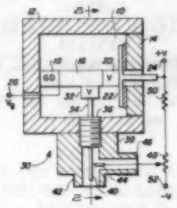
a cylindrical flange depending from an inner end of said flat edge, said cylindrical flange forming a central opening for receiving said one sealing member in contact therewith.

4,482,871

WIDEBAND VCO INCLUDING VARIABLE CAPACITIVE OUTPUT COUPLING VARACTOR FOR CONSTANT POWER OUTPUT

Martin S. Stringfellow, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 28, 1982, Ser. No. 393,146
Int. Cl.³ H03B *7/14, 9/14*
U.S. Cl. 331—101 **6 Claims**



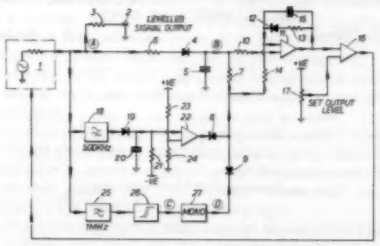
6. In a wideband resonator voltage controlled oscillator, capacitive coupling output apparatus comprising a coupling varactor providing the capacitive coupling and a variable bias circuit coupled to said varactor for varying the capacity thereof as the frequency of the voltage controlled oscillator varies to maintain the power output substantially constant.

4,482,872

SWEPT FREQUENCY OSCILLATORS HAVING TIME CONSTANT-CONTROLLED SIGNAL LEVEL DETECTOR

John D. Middleton, Welwyn, England, assignor to Marconi Instruments Limited, Chelmsford, England

Filed Dec. 7, 1981, Ser. No. 328,075
Claims priority, application United Kingdom, Dec. 9, 1980, 8039391
Int. Cl.³ H03B *23/00*
U.S. Cl. 331—178 **11 Claims**



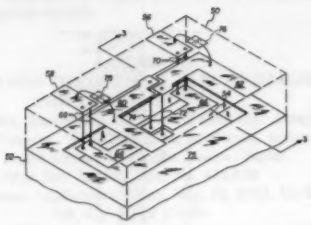
1. A swept frequency oscillator, comprising a variable frequency oscillator whose output frequency is capable of being swept over a particular frequency range; a signal level detector means for monitoring the amplitude of the output signal of the variable frequency oscillator; and means operative over at least part of the frequency range of said oscillator for controlling the time constant of the signal level detector means in dependence on the actual frequency value, so that the time constant is at least approximately inversely related to the frequency value.

4,482,873

PRINTED HYBRID QUADRATURE 3 DB SIGNAL COUPLER APPARATUS

Orville K. Nyhus, Melbourne, Fla., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 16, 1982, Ser. No. 419,108
Int. Cl.³ H01P 5/18
U.S. Cl. 333—116 3 Claims



3. The method of reducing printed circuit quadrature signal coupler size comprising, the steps of:

electrically connecting and magnetically coupling a multiplicity of juxtaposed printed conductor elements situated on opposite sides of a dielectric means over a cavity in a base plane to effect a twisted wire pair by connection of the elements through the dielectric means; and

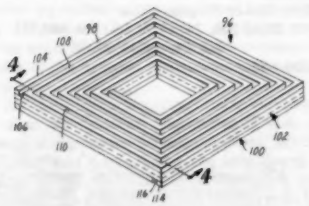
electrically coupling the ends of the twisted wire pair by lumped constant capacitive means to form a hybrid signal coupler.

4,482,874

METHOD OF CONSTRUCTING AN LC NETWORK

Roland W. Rubertus, New Brighton, and William C. Tait, Oak Park Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 4, 1982, Ser. No. 385,008
Int. Cl.³ H03H 1/00, 3/00, 7/01
U.S. Cl. 333—185 17 Claims



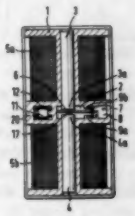
15. A substantially planar, inductive-capacitive (LC) network comprising a laminate of two pre-laminates, each of which includes a conductive sheet one surface of which is laminated to a surface of a dielectric sheet, wherein the conductive sheet of each pre-laminate has an essentially spiral-like configuration resulting in a planar multi-turn inductor in which each turn is separated from adjacent turns by a removed spiral-like configuration, and wherein the dielectric sheet of each pre-laminate contains a plurality of discontinuous apertures overlying portions of said removed spiral-like configuration of the associated conductive sheet and the remaining interconnecting portions on each dielectric sheet overlie other portions of the removed spiral-like configuration of the associated conductive sheet such that each said pre-laminate is a substantially contiguous self-supporting body without extensive gaps therein, and wherein the multi-turn inductors of each pre-laminate are positioned in general alignment with each other on opposite sides of a dielectric layer to form the laminate, a distributed capacitor thus being formed by the multi-turn inductors and the dielectric layer therebetween, which capacitor combines with said multi-turn inductors to provide said substantially planar LC network.

4,482,875

POLARIZED ELECTROMAGNETIC MIDGET RELAY

Hartger Peterseil, Emil-Geis-Str. 12, 8000 Munchen 70, Fed. Rep. of Germany

Filed Jun. 15, 1982, Ser. No. 388,742
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1981, 3124412
Int. Cl.³ H01H 51/27
U.S. Cl. 335—81 11 Claims



1. A polarized electromagnetic midget relay, comprising a pair of magnet or field coils positioned within a case and each including a magnetizable coil core, with the longitudinal axes of said coil cores being substantially aligned with each other, and said coil cores defining between their facing ends a contact gap forming part of a contact space defined between said magnet coils, and further comprising a leaf or plate armature acting as a switch, said plate armature being mounted for movement within said contact space and having its free end extending into said contact gap, characterized in that

(a) said pair of magnet coils (5*a*, 5*b*) are disposed on a bobbin and have their windings electrically connected in series;

(b) said plate armature (6) is pivotally mounted with one side thereof to the pole face of a permanent magnet (8) and includes a pair of guide tabs (6*a*, 6*b*) at the corners of its mounting end face, which tabs extend into corresponding slots of a guide element (7), and that said guide element (7) is provided with an electrical terminal pin (7*a*); and

(c) said permanent magnet (8) is positioned in the contact space (2) in such a manner that the magnetic flux of said permanent magnet is closed across said plate armature (6) and, depending on the switching position of the latter, across one of the coil cores (3 or 4) and the magnetic flux circuit of the associated magnet coil (5*a*, 5*b*).

4,482,876

ELECTROMAGNETIC RELAY

Heinz Stadler, and Alfred Heinzl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,386
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210654
Int. Cl.³ H01H 51/22
U.S. Cl. 335—83 6 Claims

1. An electromagnetic relay comprising:

a base plate;

an insulating carrier mounted on said base plate;

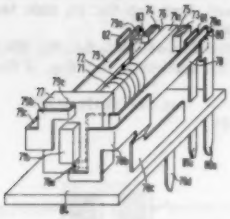
an elongate armature including a first end mounted in said carrier and a free, second end;

an elongate excitation coil disposed about said armature and extending parallel to said base plate;

at least one pole plate mounted spaced from said second end of said armature to form a working air gap therewith;

at least one contact element mounted on said base spaced from said free, second end of said armature; and

at least one contact spring including an intermediate section mounted in said carrier and a spring leg connected to said intermediate section and extending parallel to said coil and said armature, said contact spring further including a free



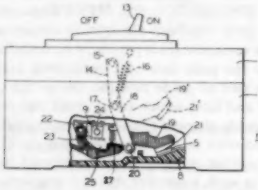
end coupled to said armature and adjacent to said contact element, said free end moved by said armature to contact and break contact with said contact element upon energization and deenergization of said coil, and a carrier mounting section connected to said intermediate section and extending from said carrier and secured to said base plate forming a resilient mount for said carrier.

4,482,877

ELECTRIC CIRCUIT BREAKERS HAVING FAST SHORT CIRCUIT RESPONSE

Roger N. Castonguay, Terryville, and Charles L. Jencks, Avon, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,617
Int. Cl.³ H01H *3/00*
U.S. Cl. 335—191 **10 Claims**



1. An improved circuit breaker contact arm arrangement for use in electric circuit breakers of the type having a trip mechanism operatively coupled by a crossbar to a pair of electrical contacts within a casing, which contacts are also operatively coupled to an ON-OFF handle for opening and closing the contacts independent of the trip mechanism, wherein the improvement comprises:

a hook-shaped movable contact arm having a pivot end opposite from a contact end and mechanically coupled with said ON-OFF handle by means of an overcenter spring and a pair of upper and lower links pivotally interconnected, said lower link being held in contact with said movable contact arm by means of a support pin, and said contact arm being pivotally joined to a contact carrier at said pivot end for allowing said contact arm to move to an open position under short circuit conditions independent from said trip mechanism;

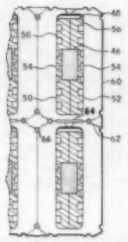
a contact spring arranged between said contact carrier and said contact arm proximate said pivot end for biasing said contact arm against said support pin, said contact spring comprising a crossover loop torsion spring including a pair of spring ends and a plurality of spring windings joined by a crossover arm.

4,482,878

INTEGRATED CONDUCTOR AND COIL STRUCTURE FOR SUPERCONDUCTING COILS

John E. Burgeson, and Gary S. Kruse, both of San Diego, Calif., assignors to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed Jan. 12, 1981, Ser. No. 224,327
Int. Cl.³ H01F *7/22*
U.S. Cl. 335—216 **14 Claims**



1. A superconducting coil comprises:

an elongated longitudinally extending first hollow metallic housing;

at least one superconducting metallic conductor disposed within said metallic housing;

an electrically and thermally non-conductive material surrounding said first metallic housing;

cooling passages positioned between said at least one superconducting metallic conductor and electrically and thermally non-conductive material; and

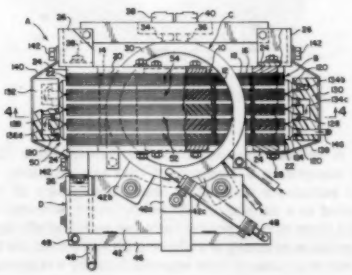
an elongated second metallic housing surrounding the electrically insulated first metallic housing and adapted to be mechanically connected to a similarly constructed structure.

4,482,879

TRANSFORMER CORE COOLING ARRANGEMENT

Stanley E. Jackowicz, Boaz, Ala., assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Feb. 24, 1983, Ser. No. 469,161
Int. Cl.³ H01F *27/08*
U.S. Cl. 336—55 **44 Claims**



1. A transformer comprising a helical coil, a core comprised of a stack of flat, thin laminations of magnetically permeable material having leg portions positioned relative to said coil to absorb the magnetic flux emanating from the coil on passage of an electrical current therethrough, and thin, flat frame means of indurated synthetic plastic and comprising frame enclosure wall portions circumscribing and defining a framed opening of said frame means, said frame enclosure wall portions being similar in contour to and clamped flatwise between the facing

flat surfaces of the said leg portions of an adjacent pair of said laminations in contour-aligned and liquid-tight relation therewith to form, together with the said adjacent pair of core laminations, internal elongated liquid-tight passageway means within said core for circulation of a liquid cooling medium therethrough, said frame means having inlet and outlet passages extending edgewise through outer side portions of the said frame wall portions of said frame means to the outside of said core and respectively communicating with opposite ends of said passageway means.

4,482,880

IRON CORE FOR THREE-PHASE ELECTROMAGNETIC INDUCTION MACHINE

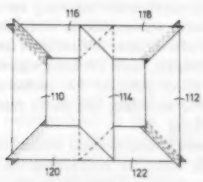
Yoshihiro Ohta, Kawanishi; Hidenori Kawakami, Amagasaki, and Keiji Tsuruta, Takarazuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 414,028

Claims priority, application Japan, Sep. 10, 1981, 56/143590

Int. Cl.³ H01F *27/24*

U.S. Cl. 336—217 **2 Claims**



1. An iron core for a three-phase electromagnetic induction machine comprising:

a plurality of legs including a central leg and outer legs; and

a plurality of yokes connecting said outer legs to said central leg;

each of said legs and yokes being formed of a corresponding stack of a predetermined number of core laminations specific thereto;

said central leg including a stack of said laminations in the shape of substantially identical parallelograms having diagonal sides on alternate laminations crossing the diagonal sides of the adjacent laminations in the stack of said central leg;

each of said outer legs being connected to associated ones of said yokes with stacked laminations of said outer legs connected to associated laminations of said yokes by angle butt joints, said butt joints being step-lapped with the width of the steps being substantially equal, the laminations of each stack corresponding to each yoke having the shapes of non-right angle trapezoids and right angle trapezoids, the non-right angle trapezoid-shaped laminations alternating with the right angle trapezoid-shaped laminations, with the lengths of the bases of successively adjacent non-right angle trapezoid-shaped laminations being successively longer by twice said width of said steps and the lengths of the bases of successively adjacent right angle trapezoid-shaped laminations being successively longer by twice said width of said steps;

the non-right angle ends of said right angle trapezoid-shaped laminations of said yokes opposite said butt joints abutting longitudinal sides of the parallelogram-shaped laminations of said central leg; the ends of said non-right angle trapezoid-shaped laminations of said yokes opposite said butt joints abutting diagonal sides of the parallelogram-shaped laminations of said central leg;

said laminations of said outer legs being in the shapes of trapezoids, said laminations on said central leg, said outer legs and said yokes each having only four sides.

4,482,881

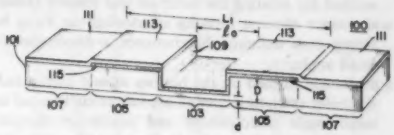
THICK EXTENDED CONTACT PHOTOCONDUCTOR

Richard B. Schoolar, Westminster, and Alfred A. Fote, Santa Monica, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Jul. 19, 1982, Ser. No. 399,267

Int. Cl.³ H01L *31/08*

U.S. Cl. 338—15 **5 Claims**



4. A photoconductor device comprising:

a semiconductor photodetector region;

nonmetallic contact means coupled to said detector region for providing a low impedance and for conducting photogenerated excess carriers and to reduce recombination, said nonmetallic contact means including semiconductor material that is thicker than said semiconductor photodetector region; and

metallic contacts coupled to said nonmetallic contact means.

4,482,882

MOISTURE SENSOR WITH VALVE METAL COMPOSITION ELECTRODES

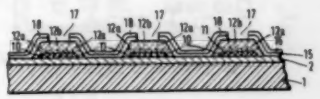
Ernst Lüder, Stuttgart; Traugott Kallfass, Grossbottwar, and Christian Borgwardt, Stuttgart, all of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,656

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151630

Int. Cl.³ H01L *7/00*

U.S. Cl. 338—34 **12 Claims**



1. A moisture sensor comprising a thin layer of the oxide of highly resistive porous low density tantalum on a moisture-insensitive substrate and at least one base electrode disposed between the substrate and said tantalum oxide layer, wherein the base electrode disposed between the substrate and said tantalum oxide layer comprises a thin layer of valve metal of a density higher than the density of the highly resistive low density tantalum from which said tantalum oxide layer has been formed.

4,482,883

ANNULAR POTENTIOMETER WITH TERMINAL

Juan L. Heredero, Badalona, Spain, assignor to Piher Sociedad Anonima, Madrid, Spain

Continuation of Ser. No. 476,044, Mar. 21, 1983, abandoned, which is a continuation of Ser. No. 367,315, Jun. 6, 1973, abandoned. This application Oct. 3, 1983, Ser. No. 538,358

Claims priority, application Spain, Jul. 30, 1968, 356.952; May 13, 1969, 367.693

Int. Cl.³ H01C *9/02*

U.S. Cl. 338—163 **3 Claims**

1. A potentiometer, comprising

a casing having a small height compared to its width,

a resistor element mounted in the bottom of said casing,

a sliding contact in permanent mechanical and electrical contact with said resistor element and having an annular and laminar shape and a diameter substantially equal to that of said resistor element,

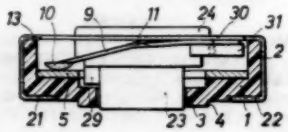
a pivot knob axially and rotatingly mounted in said casing and extending therefrom toward the outside of said casing and directly actuatable from outside said casing and forming a pivot which is operatively connected to said sliding contact for rotating the latter on said resistor element,

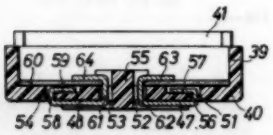
said resistor element forming an annulus cut away having facing ends defining therebetween a discontinuity of a small angle,

a projection formed on the bottom of said casing and substantially extending over an arc substantially equal to said small angle discontinuity and positioned thereat and formed as a limit stop for limiting in either direction the rotation travel of said pivot knob,

contact terminals completely rigidly secured to the ends of the potentiometer and each constituting one element of laminar structure and elongated configuration,

said casing has a circular bottom wall formed with two innermost adjacent radial slots and two outermost radial slots in symmetrical arrangement and recesses formed in the inner surface of said circular bottom wall communicating with said outermost of said radial slots and having a depth substantially equivalent to the thickness of the material constituting said contact terminals,





said contact terminals include terminal heads constituting expanded portions of curvilinear shape terminating at portions connected to the potentiometer and forming a substantially trapezoidal zone having lateral elongations thereof, the later being folded at right angles and passing through said radial slots,

one of said lateral elongations of each terminal head being folded down and applied over said recesses in such a manner that the folded down end is flush with the inner surface of said circular bottom wall,

a plurality of flattened appendices extending tantentially from the base of said casing,

said terminal heads of said contact terminals including extensions supported and retained on said flattened appendices,

a plurality of bosses extending from the surface of said flattened appendices and having a height slightly greater than the thickness of said extensions of said contact terminals,

said extensions of said contact terminals formed with apertures of complementary sectional shape to that of said bosses, and

said bosses extending into said apertures locking said extensions to said flattened appendices.

4,482,884

MONITORING DEVICE FOR DELIVERING AN ALARM SIGNAL IN DEPENDENCY ON A COUNTER RESULT

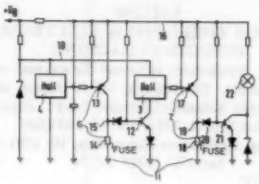
Wolfgang Hauschild, Bad Soden, and Dieter Kruck, Idstein-Heftrich, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,330

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030057

Int. Cl.³ B60Q *1/00*; G08B *21/00*

U.S. Cl. 340—52 D 12 Claims



1. In monitoring device for emitting an alarm signal by actuation of an alarm transmitter in response to a predetermined count result of a counter with at least one roller, particularly a kilometer counter, with a sensing element responsive to a predetermined roller position for emission of a position-dependent signal for actuating the alarm transmitter, the improvement comprising

an activation circuit arrangement means responsive to the position of the roller for preventing the sensing element from actuating the alarm transmitter before a second time of arrival of the roller into the predetermined roller position and for allowing the sensing element (via the position-dependent signal) to actuate the alarm transmitter for emitting the alarm signal upon the second time of arrival of the roller from a zero position into the predetermined roller position.

4,482,885

ALARM SYSTEM FOR AN AUTOMATIC TRANSMISSION

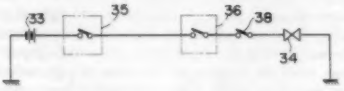
Haruo Mochida, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 10, 1981, Ser. No. 320,135

Claims priority, application Japan, Nov. 21, 1980, 55-165002

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—52 R 19 Claims



19. An alarm system for an automotive vehicle provided with an automatic transmission including a gear selector lever and with a hand brake, said system comprising:

(a) a first control switch which closes when the gear selector lever is set to a position other than park position;

(b) a second control switch which closes when the driver leaves the automotive vehicle;

(c) a third control switch which closes when the hand brake is not in a condition of complete engagement; and

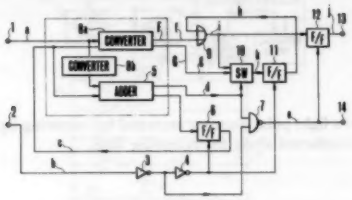
(d) an alarm device connected in series with said first, second and third control switches for producing an alarm when all of said control switches are closed.

4,482,886

APPARATUS FOR CONVERTING DIGITAL SIGNALS OF FIRST LENGTH CODE INTO SECOND LENGTH CODES

Shuzo Tsugane, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,528
Claims priority, application Japan, Apr. 15, 1981, 56-55532
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **2 Claims**



1. A code converting circuit for conversion of digital signals of first length codes into second length codes comprising:

converting means for converting an input first length code into a second length code;

means including first memory means for storage of information concerning a bit number of the second length code, for causing the converting means to send the second length code to an output signal line of K bits, starting from a bit position next to that of a different second length code in the preceding time slot;

second memory means for storage of a logical sum of the previously sent second length code;

third memory means for storage of the presently sent second length code;

means for causing the content stored in the third memory means to be delivered out in the form of a parallel output signal of K bits during the subsequent time slot when the second length code overflows, and supplying the overflowing portion of the second length code to the second memory means; and

means for causing the second length code to be sent from said converting means during the further subsequent time slot, starting from a bit position next to the second length code stored in the second memory means.

4,482,887

INTEGRATED WEIGHTED CURRENT DIGITAL TO ANALOG CONVERTER

Guy L. Crauwels, Fairfax, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

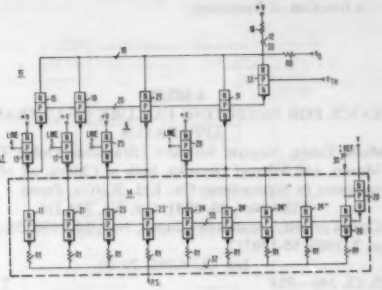
Continuation of Ser. No. 12,276, Feb. 15, 1979, abandoned. This application Jun. 1, 1983, Ser. No. 492,973
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **6 Claims**

2. A signal converter comprising:

a. logic circuits responsive to a plurality of digital input signals,

b. a transfer circuit responsive to the logic circuits and comprising at least one binary weighted current source and a plurality of groups of current sources for generating discrete binary weighted currents of different magnitudes, the binary weighted current sources including passive elements of different magnitudes for separate binary values while each current source of each group of current sources includes a passive element of the same magnitude which is equal to one half the magnitude of the smallest passive element of said at least one binary weighted current source and each group of current sources is exclusively associated with a separate binary value,

c. means connected to the logic circuits for summing the weighted currents from the transfer circuit corresponding to the binary weight of the digital input signals to the logic circuit, and



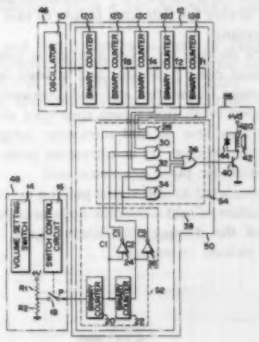
d. means for directly connecting each current switch logic circuit to the summing circuit and a different current source.

4,482,888

ALARMING APPARATUS

Seizi Todaka, Tokyo, and Teruaki Tanaka, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 24, 1981, Ser. No. 324,630
Claims priority, application Japan, Nov. 28, 1980, 55-167432; Nov. 28, 1980, 55-167433; Nov. 28, 1980, 55-167434
Int. Cl.³ G08B *3/00*
U.S. Cl. 340—384 E **8 Claims**



1. An alarming apparatus comprising:

oscillating means;

sound volume level setting means for setting the volume level of the output sound to one of a plurality of different volume levels;

modulating means for modulating a signal transmitted from said oscillating means according to a signal representing the sound volume level transmitted from said sound volume level setting means, said modulating means comprising a frequency dividing circuit connected to said oscillating means for generating a plurality of frequency signals by frequency dividing the frequency of oscillation of said oscillating means, and a frequency selecting circuit connected to said sound volume level setting means for selecting a predetermined frequency signal among the frequency signals provided from said frequency dividing circuit according to sound volume level setting information; and

sound generating means for generating sound according to a signal transmitted from said modulating means, the sound power output level of said sound generating means being a function of frequency.

4,482,889

DEVICE FOR DETECTING FAILURE OF ULTRASONIC APPARATUS

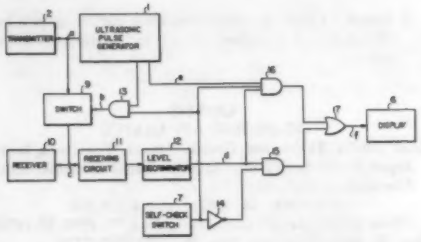
Tadashi Tsuda, Nagoya; Seiichiro Hiramatsu, Oobu; Tsuyoshi Maeno, and Mitsugi Ohtsuka, both of Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 13, 1981, Ser. No. 321,226

Claims priority, application Japan, Nov. 14, 1980, 55-160980; Dec. 2, 1980, 55-170717

Int. Cl.³ G08B *29/00*

U.S. Cl. 340—514 **7 Claims**



1. In an ultrasonic apparatus which includes an ultrasonic pulse generator, an ultrasonic transmitter and an ultrasonic receiver, a device for detecting failure of said ultrasonic apparatus comprising:

means for picking up, from a junction point between said ultrasonic pulse generator and at least one of said ultrasonic pulse transmitter and said ultrasonic pulse receiver, a damped oscillation signal appearing after excitation of the at least one of said ultrasonic transmitter and said ultrasonic receiver by an ultrasonic pulse generated from said ultrasonic pulse generator; and

means connected to said signal picking up means for detecting a failure of said ultrasonic apparatus on the basis of the state of the damped oscillation signal derived by said signal picking up means.

4,482,890

WEIGHT RESPONSIVE INTRUSION DETECTOR USING DUAL OPTICAL FIBERS

George M. Forbes, Welling, and Robert J. Seaney, Tonbridge Wells, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jan. 18, 1982, Ser. No. 340,250

Claims priority, application United Kingdom, Jan. 22, 1981, 8101881

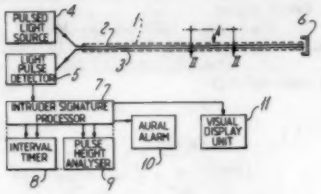
Int. Cl.³ G08B *13/22*

U.S. Cl. 340—556 **12 Claims**

1. An intruder detection system including

a pulsed light source,

at least two optical fibres each having a core and a cladding of lower refractive index than the core, one being arranged as a light transmitting fibre for conducting light pulses away from the source, and the other being arranged as a light receiving fibre disposed adjacent the transmitting fibre with the respective claddings in intimate contact substantially throughout their length,



and a light pulse detector arranged for receiving light pulses conducted along the receiving fibre.

4,482,891

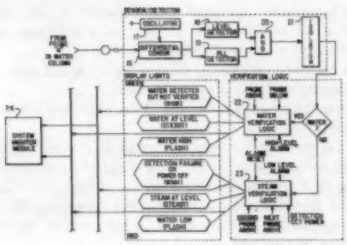
ROBUST ELECTRONIC LIQUID LEVEL GAUGE

John D. Spencer, P.O. Box 2458, Dartmouth East Postal Station, Dartmouth, Nova Scotia, Canada B2W 4A5

Filed Sep. 21, 1981, Ser. No. 304,157

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—620 **10 Claims**



1. Apparatus for sensing and indicating liquid level in a container, comprising:

(a) a plurality of electrical probe means each at a different level and each responsive to presence of liquid in its immediate vicinity;

(b) a plurality of sensing means, one each responsive to one of said plurality of electrical probe means, each comprising an operational amplifier having a pair of differential inputs and having a single one of said plurality of said electrical probe means coupled to a first of said pair of differential inputs;

(c) a signal source supplying a detectable continuous signal having predetermined level and frequency to each probe means and to each sensing means, said continuous signal being applied in phase to a second of said pair of differential inputs of each of said sensing means, a common terminal of said signal source being in electrical contact with said liquid;

(d) a plurality of detector means one each coupled to one of said plurality of sensing means, each detector means comprising a signal level detector and a frequency selective detector responsive to the predetermined frequency, each detector means yielding a logic signal only when both said signal level detector and said frequency selective detector detect signals; and

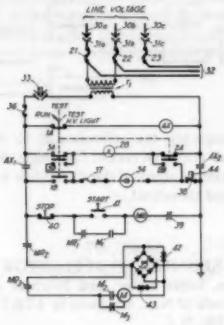
(e) a plurality of logic means each sensing the logic signals supplied by two of said plurality of detector means to indicate presence of a logic signal corresponding to presence of liquid at two electrical probe means associated with said two of said plurality of detector means.

4,482,892

CAUTION LAMP FOR HIGH VOLTAGE CONTROLLER

Samir F. Farag, and John D. Kleinecke, both of Wichita Falls, Tex., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Apr. 28, 1982, Ser. No. 373,093
Int. Cl.[3] G08B 23/00
U.S. Cl. 340—654 3 Claims



1. In a motor control center or the like including an electromagnetic contactor having contacts and a winding and including a plurality of fixed connections adapted to be coupled to a source of first, line voltage and a withdrawable contactor assembly including second connection means for engaging said fixed connections to thereby energize said contactor assembly, means for providing a visible indication of the energized state of the contactor assembly comprising;

a lamp mounted to the outer surface of said control center;

a transformer disposed within the control center and coupled to at least one of said second connection means for deriving a second, lower voltage from said first, line voltage when said contactor assembly is disposed within said motor control center and said second connections engage said first, fixed connections;

means electrically coupling said lamp to said transformer; and

switch means electrically coupled across said transformer for energizing said electromagnetic contactor winding;

whereby said light is energized when said second connection means engage said first connection means, and power is made available for energizing said contactor winding.

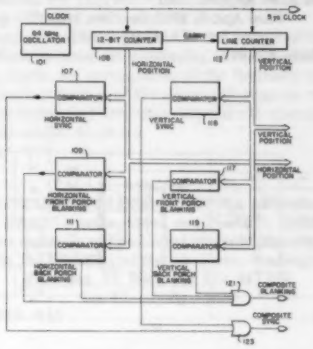
4,482,893

CATHODE RAY TUBE DISPLAY SYSTEM WITH MINIMIZED DISTORTION FROM ALIASING

Steven D. Edelson, 7 Sears Rd., Wayland, Mass. 01778

Filed Feb. 19, 1982, Ser. No. 350,195
Int. Cl.[3] G09G 1/16
U.S. Cl. 340—723 13 Claims

1. A display system comprising video display means for generating a display by means of a raster scan, encoding means responsive to input signals representing objects to be displayed by said video display means within said raster scan to store simultaneously a set of transition specifications representing each point on the objects to be displayed where the raster scan of said video display means crosses the edge of an object to be displayed, said transition specitications containing digital data identifying the positions of each said point and each of said transition specifications containing digital data varying in accordance with the slope that the edge of the object makes with the raster scan at the point represented by such transition specification, display creation means responsive to the stored transition specifications to generate a video signal and apply such video signal to said video display means to cause said video display means to display the objects represented by said input signals, said display creation means causing the video signal to undergo transitions in intensity, one corresponding to each of said transition specifications, at the locations within said raster scan corresponding to said positions represented in



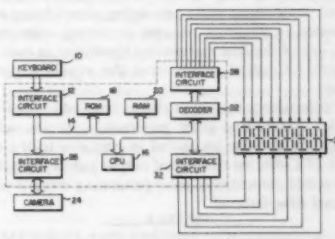
said transition specifications, with the width of each transition varying in accordance with the digital data varying with the slope in the corresponding transition specification.

4,482,894

CONTROL CIRCUIT FOR A SEGMENTED DISPLAY DEVICE

Kohichi Matsui, and Kowji Tanikawa, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 312,257
Claims priority, application Japan, Oct. 29, 1980, 55-151898
Int. Cl.[3] G09G 3/14
U.S. Cl. 340—756 4 Claims



1. A segmented display device comprising:

a segmented display section;

key input means for generating a character signal corresponding to a key operated;

means for converting the character signal to at least two character component signals respectively representing character components, the character components being representative of a character as a whole without any portions thereof overlapping each other;

decoder means having a capacity smaller than the number of characters which can be designated by said key input means, connected to said segmented display section; and

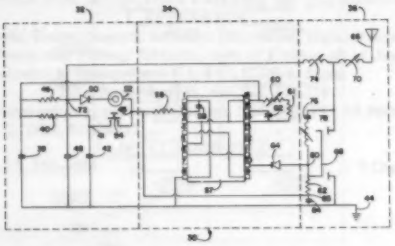
control means for sequentially supplying said at least two character component signals to said decoder means.

4,482,895

MULTI-CHANNEL MICROPOWER COMMUNICATION LINK

Stanley Weinberg, Los Angeles, Calif., assignor to Wein Products, Inc., Los Angeles, Calif.

Filed Apr. 5, 1982, Ser. No. 365,657
Int. Cl.³ H04Q 9/10
U.S. Cl. 340—825.69 16 Claims



1. A remote controlling apparatus comprising: a transmitter including:

a pulse generating circuit, the output of which is a plurality of pulses of radiant energy, each having an envelope of a selected pulse width and with a selected pulse interval; a receiver including:

an envelope detection circuit, the output of which is a plurality of pulses each having the selected pulse width and with the selected pulse interval of the transmitted radiant energy envelope,

each output pulse of the envelope detection circuit having a first transition from a first state to a second state and a second transition from the second state to the first state;

a first coincidence pulse generating circuit coupled to the output of the envelope detection circuit, the output of the first coincidence pulse generating circuit being a pulse occurring at a selected time after one of the first and second transitions of each pulse from the envelope detection circuit;

a second coincidence pulse generating circuit coupled to the output of the envelope detection circuit, the output of the second coincidence pulse generating circuit being a pulse, generated in response to, and occurring coincidentally with, one of the first and second transitions in each of the plurality of output pulses from the envelope detection circuit;

a pulse coincidence detection circuit coupled to the first and second coincidence pulse generating circuits, which is adapted to provide an output in response to the coincidence of a selected number of output pulses from the first and second coincidence pulse generating circuits within a selected time interval.

4,482,896

DIFFERENTIAL ECD DETECTOR FOR LORAN C RECEIVER

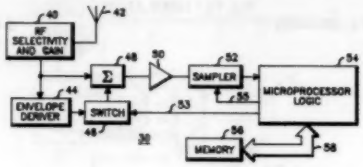
Ralph E. Menick, Euless, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1982, Ser. No. 453,428
Int. Cl.³ G01S 1/24
U.S. Cl. 343—390 10 Claims

1. Improved Loran C signal processing apparatus having envelope cycle discrepancy compensation including an accumulator for each of a plurality of predetermined sample points wherein a sample is taken and accumulated on envelope derived Loran C pulses at each of the sample points and wherein the accumulators are scanned in a fine settle mode to determine a leading accumulator (L) and a trailing accumulator (T), the improvement comprising:

means for calculating a measure M of envelope cycle discrepancy;

means for generating an ECD reference E;



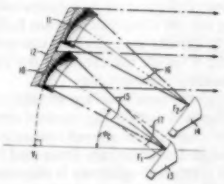
means for comparing the reference E to the measure M calculated for the most recent fine settle determination to produce a control signal if the difference is greater than a predetermined threshold.

4,482,897

MULTIBEAM SEGMENTED REFLECTOR ANTENNAS

Corrado Dragone, Little Silver, and Michael J. Gans, Monmouth Beach, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1982, Ser. No. 392,607
Int. Cl.³ H01Q 19/19
U.S. Cl. 343—779 8 Claims



1. A multibeam antenna comprising:

a reflector comprising a first and a second segment of a reflecting surface, the first and second segments being disposed in a noninterfering configuration to one another to form a separate corresponding first and second image, respectively, of a far field area of the antenna over a separate respective first and second focal surface; and

a plurality of feeds, each feed being both capable of radiating or receiving a separate beam of electromagnetic energy and disposed at a separate predetermined location on either one of the first and the second images of the far field area, where first and second feeds which are located in essentially corresponding locations on the first and second images, respectively, of the far field area provide separate beam footprints in the far field area which selectively overlap each other by a predetermined amount, which amount is dependent on the amount of overlap of the first and second feed apertures at the respective first and second images of the far field area.

4,482,898

ANTENNA FEED ARRANGEMENT FOR CORRECTING FOR ASTIGMATISM

Corrado Dragone, Little Silver, and Ralph A. Semplak, Shrewsbury, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 12, 1982, Ser. No. 433,986
Int. Cl.³ H01Q 19/20, 19/13
U.S. Cl. 343—781 P 4 Claims

1. A feed arrangement for use in an antenna, the feed arrangement comprising:

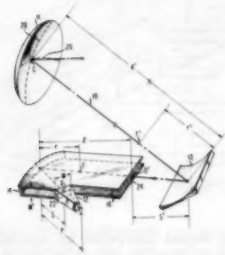
at least one feed element including a predetermined aperture

and capable of launching or receiving a beam of electromagnetic energy along a feed axis of the antenna;

a first cylindrical reflector disposed to reflect a beam launched by the at least one feed element along the feed axis of the antenna;

a second cylindrical reflector disposed along the feed axis of the antenna between the first cylindrical reflector and an aperture of the antenna, the flat axes across the first and second cylindrical reflectors being oriented orthogonal to each other along the feed axis of the antenna; and

a first and a second plate comprising a conductive material disposed with major exposed surfaces thereof parallel to



each other, the first and second plates enclosing the area between two opposing edges of both the at least one feed element and the first cylindrical reflector and extending along the feed axis of the antenna to form an aperture at the ends of the plates which is a predetermined distance from the second cylindrical reflector; the at least one feed element, first and second cylindrical reflectors and the aperture of the plates being oriented with respect to the aperture of the antenna to provide a first and a second phase center for two principal planes of curvature of the wavefront illuminating the aperture of the antenna which are a predetermined distance apart along the feed axis of the antenna.

4,482,899

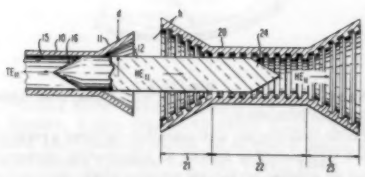
WIDE BANDWIDTH HYBRID MODE FEEDS

Corrado Dragone, Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 315,670, Oct. 28, 1981,. This application Sep. 12, 1983, Ser. No. 530,873

Int. Cl.³ H01Q *13/02*

U.S. Cl. 343—786 **3 Claims**



1. A hybrid mode feed arrangement comprising:

a smooth-walled feedhorn comprising a hollow conductive waveguide section (**10**) for propagating the TE_{11} mode introduced at the entrance of the feedhorn and an outwardly flared conductive end section (**11**) at an aperture of the feedhorn, both the hollow waveguide and flared end sections including an inner and an outer longitudinal wall surface; and

a rod (**12**) of dielectric material comprising a first end section including an outer wall which symmetrically engages a longitudinal portion (**14**) of the inner surface of the hollow waveguide section for intercepting the TE_{11} mode propagating in said hollow waveguide section and further extends through the flared end section and beyond the aperture of the feedhorn in a non-contacting arrangement for converting the TE_{11} mode into the HE_{11} mode and propagating the HE_{11} mode therein; and

a corrugated feedhorn disposed at the output of the rod of dielectric material for continuing the propagation of the HE_{11} mode, the corrugations of the feedhorn engaging a longitudinal portion of the outer wall adjacent the end of the dielectric rod extending beyond the aperture of the smooth-walled feedhorn.

4,482,900

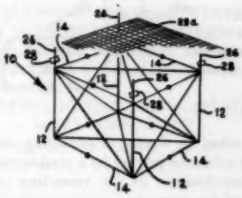
DEPLOYABLE FOLDED ANTENNA APPARATUS

Frank V. Bilek, Littleton, Colo., and David N. Buell, Mandeville, La., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 13, 1982, Ser. No. 417,726

Int. Cl.³ H01Q *15/20*

U.S. Cl. 343—915 **10 Claims**



1. A deployable, folded antenna apparatus comprising in combination:

a plurality of box truss elements arranged in rows and columns, each of said box truss elements comprising a cube unit,

said cube unit comprising in combination:

a vertical member at each corner of said cube unit,

top and bottom surface members which are connected respectively between adjacent vertical members to form a cube, said top and bottom surface members are foldable about their midpoints, and,

diagonal tapes connected between diagonally opposite corners of adjacent vertical members, said diagonal tapes being coilable at their midpoints, each cube unit being foldable about the midpoint of each top and bottom surface members to form a stowed truss unit, said stowed truss unit being deployable to form a box truss structure, said box truss structure providing a rigid support base.

4,482,901

METHOD AND SYSTEM FOR THERMALLY RECORDING INFORMATION ON A METALIZED RECORDING CARRIER

Stefan Kudelski, Le Mont-sur-Lausanne, and Jean-Claude Schlup, Cheseaux-sur-Lausanne, both of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 3, 1982, Ser. No. 345,226

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104390

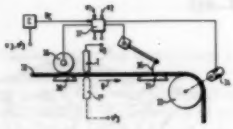
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.³ G01D *15/08*

U.S. Cl. 346—1.1 **9 Claims**

1. Method of recording color images on an electrosensitive recording carrier, under control of electrical recording signals (U_1, U_2) representative of position and color of the images on the carrier, in which the carrier includes

an elongated insulated substrate (1, 3, 32);
at least one reference marker located on the substrate;
a plurality of color elements positioned with respect to each other in a predetermined sequence or pattern, located on the substrate;
and a metallized layer (2) above the color elements, comprising the steps of
electrically contacting the metallized layer (2) with a writing or recording electrode (35);
sensing the position of the reference marker;
energizing the writing or recording electrode (35) when said writing or recording electrode is above at least one selected color element and burning off a selected portion of the metallized layer (2) by the writing or recording electrode under control of recording pulses applied to said electrode to expose a respectively selected color element;
and controlling the recording pulses to burn off selected portions of the metallized layer about a selected color



element when the writing or recording electrode is spaced from the reference marker by a predetermined distance to insure coordination of the recording signals with the position of the respective selected color element,
wherein, in accordance with the invention, the reference marker comprises a reference line (25, 26) orginally applied on the substrate, and extending longitudinally thereof;
and the color elements (9) are applied on the substrate in the form of repetitively recurring identical sets or groups of at least three adjacent differently colored color lines (6, 7, 8; 12, 13, 14), the electrode being located above a selected line or lines at a plurality of removal positions (11), the recording pulses burning off selected portions of the metallized layer above a selected color line or lines at selected removal positions to remove the metallized layer at said selected removal position, selectively, above a selected respective color line, or a selected plurality of differently colored lines.

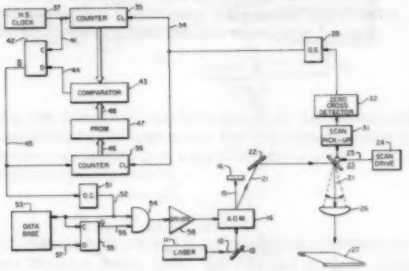
4,482,902

RESONANT GALVANOMETER SCANNER SYSTEM EMPLOYING PRECISION LINEAR PIXEL GENERATION

David C. Bailey, Cocoa Beach; Lee M. Burberry, West Melbourne; Donald E. Trimble, Melbourne; Andrew M. Bardos, Indian Harbor Beach, and Philip M. Perry, Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 30, 1982, Ser. No. 413,148
Int. Cl.³ G01D *9/42*
U.S. Cl. 346—108 **18 Claims**

1. An apparatus for recording data onto a recording medium comprising:
first means for periodically scanning an energy beam across said recording medium, which energy beam is to be modulated for recording pixels on said recording medium, and including means, disposed in the path of said energy beam, for causing each of the pixels to be recorded on said recording medium to be of uniform exposure irrespective of the angle at which said energy beam is scanned across said recording medium;
second means for storing pixel location data representative of the desired locations of recorded pixels on said recording medium in accordance with the manner in which said energy beam is scanned by said first means; and
third means for reading out the pixel location data stored in said second means and modulating said energy beam in response thereto so as to cause successive pixels to be recorded at prescribed locations on said recording medium as governed by said sotred data; and wherein



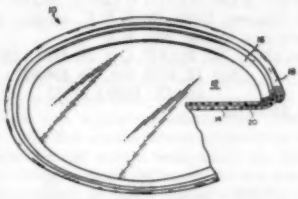
said second means comprises an addressable memory in successive memory locations of which there are stored pixel location data representative of said desired locations of recorded pixels on said recording medium that compensate at least for imaging offset of said pixels on said recording medium introduced into said beam by the uniform exposure action of said causing means.

4,482,903

DISK UNIT WITH RETAINING RING

Peter Affolter, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1983, Ser. No. 506,249
Int. Cl.³ E01D *15/32*
U.S. Cl. 346—137 **7 Claims**



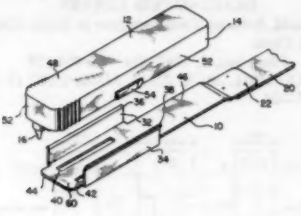
1. An optical disk unit for use with write/read apparatus, said disk unit comprising:
a flexible, disk-shaped web assembly carrying a record layer, said web assembly having an information storage region and an annular peripheral region radially outward of said storage region;
an annular retaining ring engaging said peripheral region of said web assembly; and
means forming part of said retaining ring for selectively adjusting said disk unit between two states, in one of said states the web assembly tension is sufficiently great to provide a desired degree of planarity when said disk unit is used with the write/read apparatus, and in the other of said states the web assembly tension is significantly reduced to keep said web assembly well below its elastic limit.

4,482,904

COMBINATION RECORDER PEN AND CLIP THEREFOR

Carl Geiger, Medford, N.J., assignor to DIA-Nielsen USA, Inc., Cinnaminson, N.J.

Filed Sep. 16, 1982, Ser. No. 418,638
Int. Cl.³ G01D 15/16
U.S. Cl. 346—140 A 14 Claims



1. A combination writing instrument comprising

a holding clip, the holding clip terminating forwardly in a linear nose and rearwardly in connection end;

a marking fluid containing cartridge in releasable engagement with the clip, the cartridge including a top, a bottom and sidewalls joining the top and bottom to define a hollow interior;

clip engagement means projecting from the cartridge to engage portions of the holding clip, the clip engagement means extending longitudinally of the clip and comprising at least one longitudinally oriented ridge, the ridge projecting downwardly below the bottom of the cartridge;

slot means provided in the holding clip to receive and encircle the ridge of the clip engagement means, the slot means comprising at least one elongated slot,

the slot being longitudinally oriented and of size, position and configuration to receive the ridge in releasable engagement therewithin; and

a stylus in fluid communication with the cartridge interior,

whereby the marking fluid can flow to the stylus for marking purposes when the writing instrument is in use and whereby relative longitudinal movement between the cartridge and the clip is prevented.

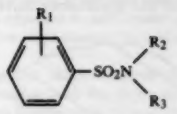
4,482,905

HEAT SENSITIVE RECORD MATERIAL

Kazuo Kaneko; Toshio Obara; Michihiro Gonda; Katsumasa Kickawa, and Mikiko Kanasugi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 511,933
Claims priority, application Japan, Aug. 31, 1982, 57-150052; Mar. 31, 1983, 58-54047
Int. Cl.³ B41M 5/18
U.S. Cl. 346—207 10 Claims

1. A heat sensitive record material comprising a support sheet and a record layer formed on the support sheet, the record layer being composed essentially of a colorless or light-colored fluoran compound, an acidic substance which is thermally reactive with the fluoran compound to develop a color and a binder, characterized in that said record layer contains an effective amount of at least one benzenesulfonamide compound represented by the general formula:



(I)

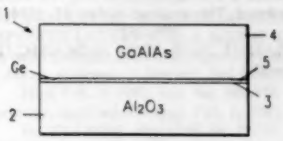
where R_1 is a hydrogen atom, a C_1–C_5 alkyl group, an acetylamino group or a halogen atom, R_2 is a hydrogen atom, a C_1–C_5 alkyl group, a cyclohexyl group or a phenyl group which may be substituted and R_3 is a C_1–C_5 alkyl group, a cyclohexyl group or a phenyl group which may be substituted, provided R_2 and R_3 may form together with N a saturated ring.

4,482,906

GALLIUM ALUMINUM ARSENIDE INTEGRATED CIRCUIT STRUCTURE USING GERMANIUM

Harold J. Hovel, Katonah, and Robert Rosenberg, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,951
Int. Cl.³ H01L 29/161
U.S. Cl. 357—16 3 Claims



1. An epitaxial layered semiconductor structure comprising in combination

a substrate taken from the group of sapphire, spinel and ZnSe,

an intermediate layer of the combination of a GaAlAs layer and a Ge layer with the Ge layer adjacent said substrate, and

a device portion of at least one layer of GaAs and GaAlAs adjacent the intermediate layer.

4,482,907

PLANAR-TYPE FIELD-EFFECT TRANSISTOR HAVING METALLIZED-WELL ELECTRODES AND A METHOD OF FABRICATION OF SAID TRANSISTOR

Paul R. Jay, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 8, 1982, Ser. No. 354,917
Claims priority, application France, Mar. 10, 1981, 81 04719
Int. Cl.³ H01L 29/48, 29/80, 29/06
U.S. Cl. 357—22 6 Claims

1. A planar field-effect transistor comprising:

a semiconductor substrate;

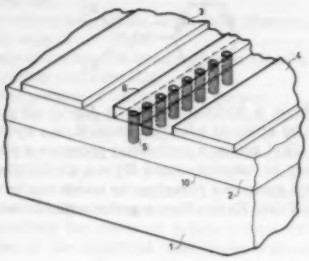
an active semiconductor layer arranged on said substrate;

a source electrode located on said active layer;

a drain electrode located on said active layer;

at least one gate electrode having a first portion arranged on said active layer and a second portion formed as a plural-

ity of metallized wells arranged in a row in a plane normal to the direction of the drainsource current, each of said



wells extending downwardly from said first portion through said active layer and into said substrate.

4,482,908

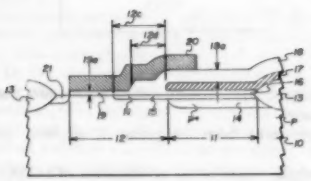
HIGH CAPACITY MEMORY CELL HAVING A CHARGE TRANSFER CHANNEL COVERED BY A STEPPED INSULATING LAYER

Donald L. Henderson, Sr., Encinitas, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 374,433, May 3, 1982, abandoned, which is a continuation of Ser. No. 232,316, Feb. 9, 1981, abandoned, which is a continuation of Ser. No. 61,755, Jul. 30, 1979, abandoned. This application Jan. 31, 1984, Ser. No. 576,763

Int. Cl.³ H01L *29/78, 27/02, 29/04;* **G11C** *11/24*

U.S. Cl. 357—23.6 **19 Claims**



1. An improved memory cell of the type which includes a semiconductor substrate having a major surface, a charge storage region and an adjacent charge transfer channel in said substrate near said surface, an insulating layer on said surface over said charge storage regions, a first conductor on said insulating layer over said charge storage region, wherein the improvement comprises:

a deep layer of dopant atoms of a first conductivity type throughout said charge storage region;

a shallow layer of dopant atoms of a second conductively type opposite to said first conductivity type throughout said charge storage region and extending therefrom to partway through an adjacent portion of said charge transfer channel;

insulating material over said channel and said first conductor having a flat surface in contact with said substrate throughout said channel and being relatively thin over the part of said channel through which said shallow layer of dopant atoms does not extend plus an adjacent portion thereof over said shallow layer followed by two successive stepped increases in thickness through the remainder of said channel over said shallow layer;

a second conductor having a stepped surface in face-to-face contact with said stepped insulating material over said charge transfer channel;

the distance along said channel from the second conductor at the point where the first stepped increase in thickness in said insulating material begins to said first conductor being less than the length and width of all other components in said cell; and

said distance having a dimensional variation of only one mask alignment tolerance.

4,482,909

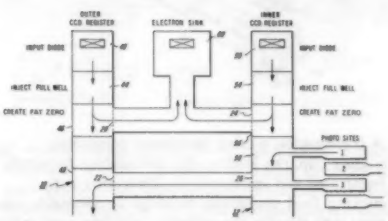
SIGNAL EQUALIZATION IN QUADRILINEAR IMAGING CCD ARRAYS

David L. Heald, Solvang, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1982, Ser. No. 404,179

Int. Cl.³ H01L *29/78, 27/14, 31/00;* **G11C** *19/28*

U.S. Cl. 357—24 **3 Claims**



1. A charge coupled device imaging array wherein photogenerated charge is transferred from a row of photosites to an immediately adjacent first row of CCD memory cells comprising an inner CCD register and to a second row of CCD memory cells next to said first row of CCD memory cells comprising an outer CCD register through said inner register, means for introducing a fat zero electron charge into said inner and outer registers to eliminate the offset in charge being transferred through said inner register to said outer register and the charge only to said inner register, said means for introducing a fat zero electron charge comprising:

first circuit means at each input end of said inner and outer registers for introducing a predetermined charge into said inner and outer registers, and

second circuit means coupled to each of said inner and outer registers for draining off predetermined amounts of charge each, the charge remaining at the input ends of said registers defining the fat zero charges introduced into said charges transferred from said row of photosites.

4,482,910

HETEROJUNCTION EMITTER TRANSISTOR WITH SATURATION DRIFT VELOCITY GRADIENT IN BASE

Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 245,546, Mar. 19, 1981, abandoned. This application Jan. 30, 1984, Ser. No. 574,648

Claims priority, application Japan, Mar. 21, 1980, 55-36599

Int. Cl.³ H01L *29/165, 29/203, 29/205, 29/72*

U.S. Cl. 357—34 **20 Claims**

1. A thermionic emission transistor comprising:

an emitter region formed with a semiconductor material having a first conductivity type and a high impurity concentration;

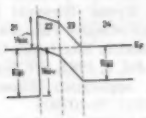
a collector region formed with a semiconductor material having the first conductivity type and a high impurity concentration;

a base region made of a semiconductor material having a second conductivity type opposite to said first conductivity type and a high impurity concentration, said base region having an impurity concentration distribution such that said base region impurity concentration is maximum

in portions adjacent to said emitter region and decreases with distance from said emitter region; and

a built-in impurity concentration gradient to generate an electric field of a sufficient magnitude to establish carrier travel velocity in substantially all of said base region at a saturation velocity;

that portion of said emitter region located adjacent to said base region having an energy band gap broader than that of the base region and an impurity concentration higher than that of the base region,



that portion of said base region located adjacent to the emitter region having an impurity concentration of at least about 3×10^{18} cm^{-3};

the impurity concentration of said emitter region and the impurity concentration of that portion of said base region located on the emitter region side being set to insure that the width of the depletion layer growing across the pn junction of the emitter and base regions is substantially the same as the mean free path of carriers.

4,482,911

MONOLITHIC INTEGRATED CIRCUIT EQUIVALENT TO A TRANSISTOR ASSOCIATED WITH THREE ANTISATURATION DIODES

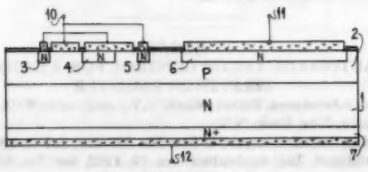
Jean B. Quoirin, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 11, 1980, Ser. No. 158,581

Claims priority, application France, Jun. 12, 1979, 79 14996

Int. Cl.[3] **H01L** *27/06, 29/72, 29/167;* **H03K** *17/04*

U.S. Cl. 357—46 **4 Claims**



1. A monolithic integrated circuit structure that is electrically equivalent to a transistor having an emitter, a base and a collector, an input terminal, a first diode coupling said input terminal to said collector, a second diode coupling said input terminal to said base and a third diode in parallel with said second diode but connected with opposite polarity thereto, comprising:

a first semiconductor substrate layer of a first conductivity type and having upper and lower surfaces;

a second semiconductor layer having an upper surface adjacent to said lower surface of said substrate and a lower surface and being of said first conductivity type but having a higher doping level than said substrate;

a metalization adjacent to said lower surface of said second layer and forming a contact to said collector of said transistor;

a third continuous semiconductor layer having a lower surface in contact with the upper surface of said substrate layer and an upper surface, said third layer being of a second conductivity type opposite to said first conductivity type, said layer functioning as said transistor base;

a fourth semiconductor region of said first conductivity type, formed in said upper surface of said third layer and functioning as a first pole of said second diode, the second pole of said second diode being formed by said third semiconductor layer, said first diode being formed by said third layer and said substrate said fourth region surrounding a portion of said third layer;

a fifth semiconductor region of said first conductivity type and formed in said upper surface of said third layer, said fifth region functioning as one pole of said third diode, the other pole of said diode being formed by said third layer; and

a sixth semiconductor region of said first conductivity type and formed in said upper surface of said third layer said sixth region functioning as said transistor emitter, a vertical portion of said monolithic circuit structure including said fourth and fifth regions and a corresponding vertical section of said substrate and second layer being formed so as to have a reduced lifetime of minority carriers.

4,482,912

STACKED STRUCTURE HAVING MATRIX-FIBERED COMPOSITE LAYERS AND A METAL LAYER

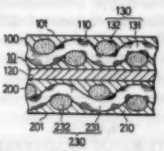
Akio Chiba; Seiki Shimizu; Kelichi Kuniya, and Jin Onuki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

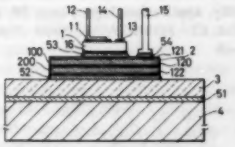
Filed Feb. 2, 1982, Ser. No. 344,976

Claims priority, application Japan, Feb. 6, 1981, 56-15695

Int. Cl.[3] **H01L** *23/14, 23/18, 23/54*

U.S. Cl. 357—67 **12 Claims**





1. A stacked structure comprising:

a first composite layer including a first metal matrix and first fibers embedded therein, which first fibers have a thermal expansion coefficient lower than that of said first metal matrix so that said first composite layer has as a whole a first thermal expansion coefficient lower than that of said first metal matrix;

a second composite layer including a second metal matrix and second fibers embedded therein, which second fibers have a thermal expansion coefficient lower than that of

said second metal matrix so that said second composite layer has as a whole a second thermal expansion coefficient lower than that of said second metal matrix; and

a metal layer sandwiched between said first and second composite layers and joined directly and rigidly to said first and second composite layers, wherein said second thermal expansion coefficient of said second composite layer is lower than said first thermal expansion coefficient of said first composite layer;

said first and second metal matrices are made of the same metal;

said first and second fibers are made of the same material and are arranged non-directionally respectively; and

said metal layer is thinner than said first and second composite layers.

4,482,913

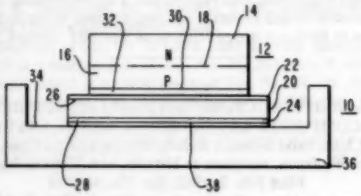
SEMICONDUCTOR DEVICE SOLDERED TO A GRAPHITE SUBSTRATE

Michael A. Burke, and Clarence A. Andersson, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 24, 1982, Ser. No. 351,809

Int. Cl.³ H01L *21/58, 23/14, 23/32*

U.S. Cl. 357—67 **4 Claims**



1. A power semiconductor device comprising a wafer of silicon, said wafer containing at least one p-type conductivity region and at least one n-type conductivity region with a p-n junction between adjacent regions of different conductivity type, said wafer having opposed surfaces, and a graphite substrate, said graphite substrate being soldered to one of said opposed surfaces of said wafer.

4,482,914

CONTACT STRUCTURE OF SEMICONDUCTOR DEVICE

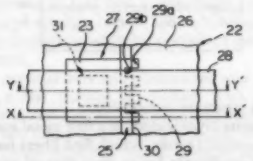
Toru Mano, Fukushima; Takeshi Fukuda, Kawasaki; Toshitaka Fukushima, Yokohama; Kouji Ueno, Kawasaki, and Kazuo Tanaka, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1981, Ser. No. 334,924

Claims priority, application Japan, Dec. 29, 1980, 55-187083

Int. Cl.³ H01L *29/06, 29/04, 23/48*

U.S. Cl. 357—68 **9 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

an insulating layer covering a surface of said semiconductor substrate and having a a sloped portion and a contact hole;

an additional layer formed on said insulating layer and having a hole therein corresponding to said contact hole in said substrate layer, a side of the perimeter of said hole in said additional layer winding on said sloped portion of said insulating layer and on a side of said sloped portion to define protruding and indented portions of said additional layer; and

a wiring layer formed on said insulating layer and additional layer to contact said semiconductor substrate thru said contact hole in said insulating layer and said hole in said additional layer, said wiring layer covering said protruding and indented portions of said additional layer and the exposed portions of said insulating layer therebetween.

4,482,915

LEAD FRAME FOR PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICE

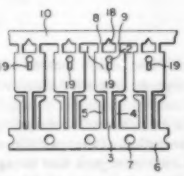
Mikio Nishikawa, Kyoto; Hiroyuki Fujii, Osaka; Kenichi Tateno, Shiga, and Masami Yokozawa, Kyoto, all of Japan, assignors to Matsushita Electronics Corp., Osaka, Japan

Filed Jul. 6, 1982, Ser. No. 395,799

Claims priority, application Japan, Jul. 6, 1981, 56-100697[U]; Jul. 9, 1981, 56-107905

Int. Cl.³ H01L *23/30, 23/32, 21/60*

U.S. Cl. 357—72 **5 Claims**



1. A lead frame for plastic encapsulated semiconductor device, comprising: a first connecting band; a plurality of external leads extending from said first connecting band in one direction; a substrate support connected to a distal end of one of said external leads and also serving as a heat sink; at least two strips one end of each of which is connected to a side of said substrate support, an opposite side of said substrate support being connected to said one of said plurality of external leads; and a second connecting band connected to the other ends of said at least two strips and opposing said first connecting band through said substrate support, wherein said second connecting band has, at a side thereof adjacent said substrate support and between said at least two strips, a notch for allowing positioning and for decreasing thermal deformation during encapsulation of said device.

4,482,916

AUTOMATIC COLOR CONTROL FOR A DIGITAL TELEVISION RECEIVER

Alfonse Acampora, Staten Island, N.Y., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 394,839, Jul. 2, 1982, abandoned. This application Oct. 29, 1982, Ser. No. 437,825

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—27 **15 Claims**

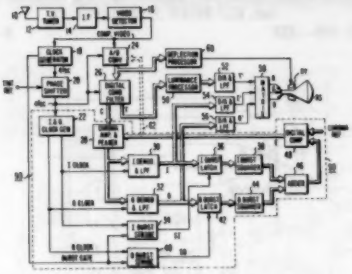
1. In a television receiver including a source of digital chroma signals having a chroma reference burst component, a digital chroma gain control apparatus comprising:

gain controlled processing means coupled to said source of digital chroma signals, including means for producing a chroma signal scaled in response to a chroma control signal;

sampling means responsive to the chroma reference burst component of said digital chroma signals for producing first and second digital reference signals, said first and second digital reference signals being in quadrature phase

relation and having magnitudes related to said digital chroma reference burst component;

calculating means for developing a digital sum signal corresponding to successive sums of the respective squares of the magnitudes of said first and second digital reference signals; and



control means for developing said chroma control signal in response to said digital sum signal departing from a predetermined value, said control means developing said chroma control signal having a value for adjusting the gain of said processing means to cause said digital chroma signals to have the magnitude producing said digital sum signal of said predetermined value.

4,482,917

METHOD FOR A REPRODUCTION OF COLORED MASTERS IN FOUR-COLOR PRINTING USING COLOR REDUCTION

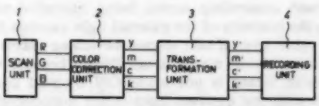
Werner Gaulke, Kiel, and Eggert Jung, Schoenberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,449

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3109190

Int. Cl.³ G03F *3/00*

U.S. Cl. 358—80 **9 Claims**



1. A method for reproduction of colored masters for four-color printing in which the color master having chromatic and gray areas is trichromatically scanned and color measured value signals R, G, B thus obtained are converted into printing ink signals yellow (Y), magenta (M), cyan (C) and black (K), forming a color spacer with a gray line and which are used for the production of color separations for the printing inks magenta (M), cyan (C) and black (K) employed for the four-color printing, wherein a color reduction is done, comprising the steps of distinguishing between gray areas and chromatic areas of the master, making a color reduction in the gray area in which a gray balance corresponding to the three printing ink signals yellow (Y), magenta (M) and cyan (C) is utilized and making a color reduction in the chromatic area of the master which is matched to the respective maximum, mean or minimum value of the three printing ink signals yellow (Y), magenta (M) and cyan (C).

4,482,918

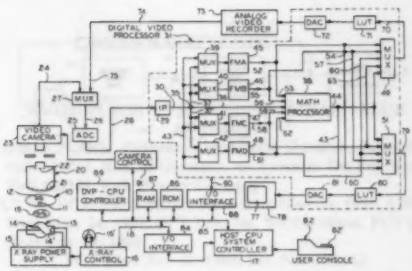
METHOD AND APPARATUS FOR X-RAY IMAGE SUBTRACTION

Gary S. Keyes, Hartland; Stephen J. Riederer, Wauwatosa; Thomas W. Lambert, Dousman, and Barry N. Stone, Waukesha, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,683

Int. Cl.³ H04N *5/32*

U.S. Cl. 358—111 **16 Claims**



16. Apparatus for producing a visible image of a body region defined by the X-ray source, means for controlling said source to expose a body region before (pre-contrast) and after (post-contrast) an X-ray contrast medium enters said region to a low average energy X-ray beam or alternately to a high average energy beam when low kilovoltage (kV) and high kV, respectively, are applied to the X-ray source, television camera means having an image target whose scan readout results in converting X-ray image frames resulting from said exposures to analog video signals, means for converting said signals to digital data corresponding in value to the intensities of the picture elements (pixels) that compose a frame, and means for converting digital values to logarithmic equivalents:

first memory means for storing the pixel data for a mask image resulting from a low energy pre-contrast exposure,

second memory means for storing the pixel data for a mask image resulting from a high energy pre-contrast exposure made shortly after said low energy pre-contrast exposure,

processor means,

third memory means for storing difference image digital pixel data resulting from subtraction by said processor means of the low energy mask image data in said first memory means and the live image data resulting from a low energy post-contrast exposure,

fourth memory means for storing difference image digital pixel data resulting from subtraction by said processor means of the high energy pre-contrast image data in the second memory means and the live image data resulting for a high energy post-contrast exposure,

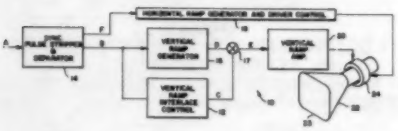
said processor means operating to multiply simultaneously the difference image pixel data from said third memory means and difference image pixel data from said fourth memory means by coefficients k_l and k_h, respectively, and said means subtracting one of the sets of data resulting from said multiplications from the other to produce a digital image data set representative of a hybrid subtraction image,

means for converting said last named digital data set to analog video signals, and means for storing the video signals.

4,482,919
APPARATUS FOR OBSCURING BLANK SPACES BETWEEN RASTER LINES AND HARD COPIES MADE FROM SCREEN CRT

Lawrence E. Alston, Chelmsford, and David S. Haroutunian, Chelsea, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 14, 1982, Ser. No. 378,089
Int. Cl.³ H04N 5/04, 5/34
U.S. Cl. 358—152 11 Claims



1. A system for providing multiple interlaced raster lines on a CRT so as to minimize the visibility of the blank spaces between the raster lines in any hard copy of the screen of the CRT comprising:

means responsive to a composite video waveform for stripping and separating sync pulses from the video waveform to provide vertical and horizontal sync pulse trains;

means responsive to said vertical and horizontal sync pulse trains for producing, respectively, vertical and horizontal ramp pulse train signals for controlling, respectively, the vertical and horizontal position of the electron beam of the CRT;

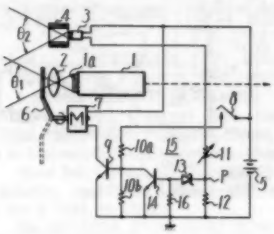
interlacing means responsive to said vertical sync pulse train for providing a DC bias voltage for combination with said vertical ramp pulse train signal, said DC bias voltage being selectively varied in synchronism with said vertical sync pulse train through a repetitious sequence of different DC bias voltage levels to vary the DC level of said vertical ramp pulse train signal through said sequence of DC voltage levels and thereby provide a corresponding sequence of parallel interlaced raster lines vertically offset with respect to each other; and

means for calibrating said sequenced DC bias voltage levels such that said vertical offset raster lines are equally spaced apart across the screen of the CRT wherein the frequencies of said vertical and horizontal ramp pulse train signals are phase related with respect to each other so as to provide a first field of raster lines and a second field of raster lines interlaced with the raster lines of said first field to collectively define a frame, and wherein said calibration means comprises selectively actuatable means for providing an alternating DC bias voltage at the output of said interlacing means in synchronization with said vertical sync pulse train for varying the DC level of alternate ramp pulses of said vertical ramp pulse train signal to vertically offset the raster lines of one of said two fields to coincide with the raster lines of the other of said two fields when said alternating DC bias voltage is combined with said vertical ramp pulse train signal, and means for selectively varying the DC output voltage level from said interlacing means to enable the raster lines of said first and second fields to be visually aligned with respect to each other.

4,482,920
PROTECTIVE APPARATUS FOR PICK-UP TUBE

Shinichi Yoshida, Hino, and Kazutaka Kobayashi, Kokubunji, both of Japan, assignors to Nippon Interphone Co. Ltd. and Tokyo Electronic Industry Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 250,234, Apr. 2, 1981, abandoned. This application Jan. 20, 1984, Ser. No. 572,951
Claims priority, application Japan, Apr. 14, 1980, 55-50514
Int. Cl.³ H04N 5/26, 5/197
U.S. Cl. 358—228 8 Claims



1. A protective apparatus for a pick-tube of a television camera comprising:

(a) detecting means for detecting an amount or intensity of an external light incident on a pick-up tube of a television camera;

(b) preventing means for preventing the external light from being incident on said pick-up tube when the television camera is not being used;

(c) driving means including a power source and a first switching means for driving said preventing means;

(d) controlling means coupled to said detecting means for controlling said first switching means; and

(e) a second switching means connected between said power source and said switching means, said second switching means being made ON when the television camera is used to make said first switching means ON and drive said preventing means to permit introduction of the external light to said pick-up tube, said controlling means including a means coupled to said detecting means for determining a reference value and for providing a reference voltage when the intensity of the external light exceeds said reference value and a third switching means for operating said first switching means in response to said reference voltage, said controlling means being operative such that when the intensity of the external light exceeds the reference value, even if said second switching means is made ON, said driving means is not driven because said first switching means is not made ON by said controlling means whereby external light is not introduced to said pick-up tube.

4,482,921
LEVEL SHIFTER FOR AN AUTOMATIC KINESCOPE BIAS SAMPLING SYSTEM

Paul Filliman, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,830
Int. Cl.³ H04N 5/68, 9/535
U.S. Cl. 358—243 13 Claims

1. In a system for automatically controlling the level of black image current conducted by an image display device in a video signal channel of a video information display system, said control system being operative during control intervals within image blanking intervals and including signal processing apparatus comprising:

means for developing an output signal representative of the magnitude of said black image current;

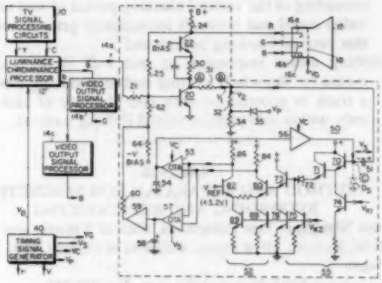
amplifier means with a signal input, and an output for pro-

viding a bias control signal to said image display device for maintaining a desired black current level;

clamping means including a charge storage device for receiving said representative signal;

means operative during a reference interval within said control interval for establishing a reference voltage on said storage device;

level shifting means for coupling said reference voltage to



said signal input of said amplifier means for biasing said signal input compatible with the input bias requirements of said amplifier means; and

means for rendering said level shifting means conductive during said control intervals, and for substantially inhibiting input currents of said level shifting means during intervals other than said control intervals to prevent the charge on said storage device and said reference voltage from being modified during said other intervals.

4,482,922

PICTURE SIGNAL READ SYSTEM

Takeshi Amemiya, Suginami, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

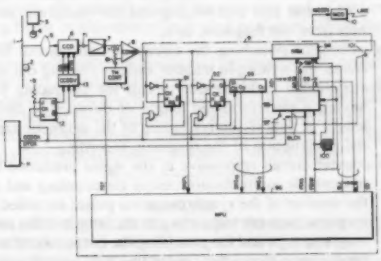
PCT No. PCT/JP81/00329, § 371 Date Jul. 14, 1982, § 102(e) Date Jul. 14, 1982, PCT Pub. No. WO82/01798, PCT Pub. Date May 27, 1982

PCT Filed Nov. 11, 1981, Ser. No. 403,495

Claims priority, application Japan, Nov. 17, 1980, 55-161740

Int. Cl.³ H04N *1/40, 1/12, 1/17, 1/4*

U.S. Cl. 358—282 **12 Claims**



1. A picture signal read system comprising:

read means for reading the contents of a document line by line and for providing a picture signal for each line of the document, the picture signal being responsive to said contents of the document;

conversion means for comparing said picture signal with a predetermined threshold level and for converting the picture signal into a binary picture signal in accordance with the contents of the documents, the binary picture signal having a white level and a black level;

divide means for dividing the binary picture signal of each line scanned by said read means into a plurality of blocks;

detecting means for detecting the presence of a black level signal in the block and for providing a detect output responsive to said detecting a black level;

send means for sending, in accordance with said detect output, only the picture data corresponding to the block containing the detected black level signal;

count means for counting each block containing a black level signal; and

control means for changing said threshold level in accordance with the number of counted blocks.

4,482,923

METHOD FOR AUTOTYPICAL TONAL VALUE ANALYSIS

Gerhard Fischer, Offenbach, and Karl Scheuter, Darmstadt, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

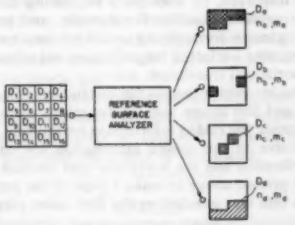
PCT No. PCT/DE80/00110, § 371 Date Mar. 31, 1981, § 102(e) Date Mar. 24, 1981, PCT Pub. No. WO81/00466, PCT Pub. Date Feb. 19, 1981

PCT Filed Jul. 29, 1980, Ser. No. 245,643

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1979, 2931098

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—283 **6 Claims**



1. A method for reproducing printing forms by means of scanning an original in accord with a scanning raster and by means of scanning a recording surface in accord with a conforming recording raster comprising the steps of:

(a) resolving each raster field of the original by means of fine scanning into surface elements in accord with the desired detail resolution,

(b) combining said surface elements which have approximately identical tonal values to form subsurfaces,

(c) storing said subsurfaces of approximately identical tonal values,

(d) composing each raster field of the recording site of surface elements and subsurfaces corresponding to the subsurfaces of the scanning site,

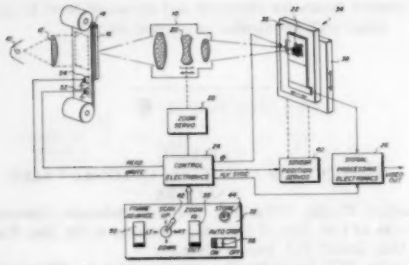
(e) allocating to each subsurface element of the surfaces of the recording site a recording signal determining whether for this surface element a point which is still printable is or is not recorded, by filling up the surface elements of the recording site with a statistical distribution of said recording signals by means of a random generator whereby a subsurface receives a number of smallest printable points which correspond in statistical mean to the tonal values of the respective stored subsurfaces of the scanning site, and

(f) controlling the recording of said printing poins by reading out said recording signals.

4,482,924
VIDEO PLAYER, FILM MEDIUM, AND PHOTOGRAPHIC PRINTER FOR AUTOMATIC CROPPING

Scott A. Brownstein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,069
Int. Cl.³ H04N *1/22, 5/30;* **G03B** *27/34*
U.S. Cl. 358—302 **8 Claims**



1. A photographic printing system, comprising:

a photographic film having an image and means for receiving coded information;

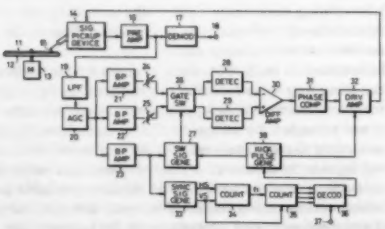
film video player means for viewing the image on said film to produce a video signal for displaying said image on a video monitor, said video player means including means for selectively varying the magnification of the displayed image, and for selecting a portion of the magnified image to be displayed, by selectively translating the magnified image vertically and/or horizontally, and including recording means for applying coded information to the film representing a selected magnification and selected vertical and horizontal translation; and

photographic printer means for producing reflection prints from said film image, said printer means including means for sensing the coded information on the film, and means responsive to the sensed information for adjusting the magnification and the horizontal and vertical translation of the printed image to make a print of the portion of the image that was selected on the film video player means.

4,482,925
QUICK-MOTION REPRODUCING SYSTEM IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara, and Ryozo Abe, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 11, 1982, Ser. No. 357,294
Claims priority, application Japan, Mar. 12, 1981, 56-35568
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—342 **6 Claims**



1. A quick-motion system for reproducing a rotary recording medium by use of a reproducing element, said rotary recording medium having a video signal recorded on a spiral track and further having a predetermined reference signal recorded on said spiral track, said predetermined reference signal being recorded within intervals corresponding to vertical synchronizing signals within vertical blanking periods of said recorded video signal for each track turn of said spiral track, said quick-motion reproducing system comprising:

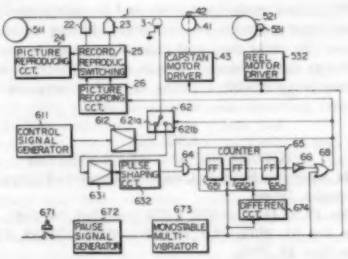
kick pulse generating means for generating a plurality of kick pulses only within a predetermined shifting interval consisting of the vertical blanking period of said recorded video signal and intervals immediately prior to and after this vertical blanking period; and

shifting means responsive to said kick pulse generating means for stepwisely shifting said reproducing element to a track in accordance with said plurality of kick pulses only within said predetermined shifting interval.

4,482,926
METHOD AND APPARATUS FOR MAGNETIC RECORDING AND REPRODUCING

Hideo Nishijima; Isao Fukushima, both of Katsuta, and Masao Hibi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1981, Ser. No. 318,256
Claims priority, application Japan, Nov. 7, 1980, 55-155920
Int. Cl.³ H04N *5/78;* **G11B** *27/08*
U.S. Cl. 360—14.2 **4 Claims**



1. An apparatus for magnetic recording and reproducing in which the re-start of the magnetic recording after a pause period is carried out, said apparatus comprising:

a control head for both writing-in synchronization signals to a magnetic tape and reading-out the synchronization signals from the magnetic tape,

a switch for switching the circuit of said control head between the writing-in manner and the reading-out manner,

a monostable multivibrator circuit for producing a signal having a predetermined length of duration to define the length of time of the rewinding of the magnetic tape after the interruption of the magnetic recording,

a counter circuit responsive to the signal produced by said monostable multivibrator circuit for counting and storing the number of the synchronization pulses recorded on the magnetic tape corresponding to the length of the rewound magnetic tape and for providing the output signal used for producing a signal for controlling said switch and a picture recording circuit,

an inverter,

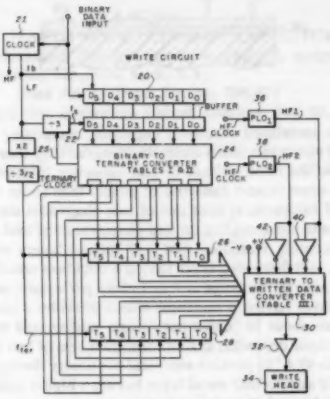
an OR gate wherein the output signal of said counter circuit and the output signal of said multivibrator circuit combined through said inverter and said OR gate to provide said control signal for controlling said switch and said picture recording circuit, and

whereby the determination of the timing of the re-start of the magnetic recording is carried out in accordance with the output signal of said counter circuit.

4,482,927
TERNARY MAGNETIC RECORDING AND REPRODUCING SYSTEM WITH SIMULTANEOUS OVERWRITE

Hartvig E. Melbye, Boulder, Colo., and George V. Jacoby, Los Altos, Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,353
Int. Cl.³ G11B 5/09
U.S. Cl. 360—40 **23 Claims**



1. A magnetic recording and reproducing system for recording information in discrete states on a magnetic medium and recovering said information therefrom, comprising:

means for magnetizing regions of said medium at a first polarity representing a first of said discrete states, and at a second polarity representing a second of said discrete states,

means for erasing regions of said medium representing a third of said discrete states wherein said erasing means includes means for generating a multiplicity of alternating reversals and means for controlling the phase and frequency of said alternating reversals in accordance with said groups of binary digits, and

means for receiving input binary digits

mapping means responsive to groups of a first predetermined number of said binary digits for controlling the magnetizing and erasing of a second predetermined number of said regions, the polarity of said magnetizing and of said erasing being in accordance with said groups of binary digits, and

a system write clock wherein said mapping means generates digits of a higher order than binary in response to said binary digits in synchronism with said system write clock, said higher order digits being generated in groups of said second predetermined number in response to said groups of a first predetermined number of binary digits.

4,482,928
TRACKING CONTROL SYSTEM FOR MAGNETIC RECORDING AND REPRODUCING SYSTEM

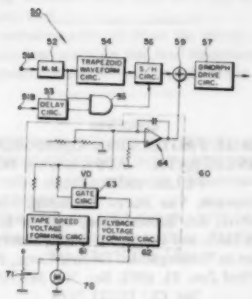
Ryusuke Moriya; Takeo Eguchi, both of Hadano, and Takeo Ohba, Sagamihara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 261,445, May 7, 1981,. This application Jul. 27, 1983, Ser. No. 517,047
Claims priority, application Japan, May 10, 1980, 55-61887
Int. Cl.³ G11B 21/10, 15/02, 5/52
U.S. Cl. 360—77 **7 Claims**

1. Apparatus for reproducing digital information signals, which include block synchronization signals utilized for converting said digital information signals to analog signals, that have been recorded in successive, parallel channel tracks extending obliquely on a magnetic tape, with adjacent ones of said tracks having the digital information signals recorded therein with different azimuth angles, the apparatus comprising:

at least two reproducing magnetic heads simultaneously movable in a direction along said tracks for simultaneously reproducing said digital information signals recorded therein, said at least two magnetic heads having different azimuth gaps, respectively;

phase locked loop means for forming at least one clock signal in response to said reproduced digital information signals;



means for extracting said block synchronization signals from said reproduced digital information signals in response to said at least one clock signal;

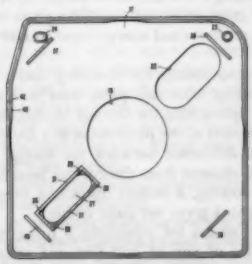
phase detecting means for detecting a phase error between said extracted block synchronization signals reproduced from adjacent ones of said tracks by said at least two magnetic heads; and

control means for controlling the relative positions between said tracks and said magnetic heads in response to said detected phase error so that said magnetic heads accurately scan respective ones of said tracks.

4,482,929
MAGNETIC RECORDING DISK CARTRIDGE

John L. Beck, Byron; Randy J. Bornhorst, Rochester; Donald J. Smith, Byron, and Michael N. Zell, Olmsted County, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1982, Ser. No. 391,060
Int. Cl.³ G11B 23/02
U.S. Cl. 360—133 **16 Claims**



1. A floppy disk cartridge comprising:

a rigid housing having a pair of spaced walls defining a flat, substantially closed cavity, each of said walls including a

through-hole, and at least one of said walls including a head-receiving aperture;

a generally flat floppy disk nonremovably held within said cavity, said disk including a mounting aperture aligned with said through-holes, but smaller in dimension than said through-holes; and

a rigid, but movable, disk-cleaning-member, located to form a part of said one wall, said cleaning member being normally spaced from said disk and, by virtue of being movable, being free to move into said cavity and into cleaning contact with said disk.

4,482,930

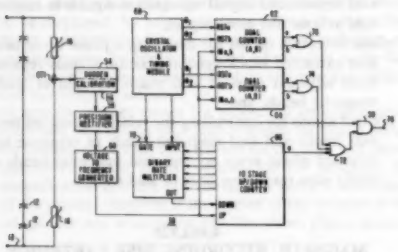
ELECTRICAL PROTECTION EQUIPMENT WITH DIGITAL INTEGRATION APPARATUS FOR FIRING PULSE INITIATION

Charles A. Peterson, Van Buran Township, Monroe County; Louis C. Grove, Jr., Bloomington, both of Ind.; Robert C. Miller, Penn Hills, and Robert M. Oates, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 11, 1982, Ser. No. 387,715

Int. Cl.³ H02H *7/16*

U.S. Cl. 361—16 **14 Claims**



1. Electrical protection equipment comprising:

means for monitoring current through a protected element;

means for developing, from said means for monitoring current, a pulse train in which a pulse occurs upon each input of a given increment of energy to said protected element;

first counter means having said pulse train supplied thereto for producing a first distinctive output upon the accumulation of a given pulse count within a given time that represents a predetermined energy input to said protected element,

second counter means for receiving said pulse train and decrementing from said pulse train in a time regulated manner representing the thermal cooling rate of said protected element so the pulse count at a given instant represents the difference between the energy input to said protected element from the current therethrough and its thermal cooling, a second distinctive output being produced upon a given net pulse count;

firing pulse means for producing a firing pulse upon the occurrence of any of said first and second distinctive outputs from said counter means and the flow of current through said element to be protected; and,

means, responsive to said firing pulse, for terminating current conduction through said protected element.

4,482,931

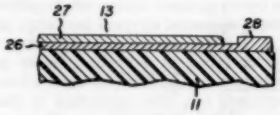
METALLIZED CAPACITOR WITH IMPROVED BILAYER ELECTRODES

Angelo Yializis, South Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation of Ser. No. 295,928, Aug. 24, 1981, abandoned. This application Mar. 6, 1984, Ser. No. 585,036

Int. Cl.³ H01G *1/01, 1/10*

U.S. Cl. 361—273 **30 Claims**



1. A metallized electrical capacitor comprising a pair of spaced electrodes and a dielectric material strip therebetween, wherein the rated voltage of said capacitor is adapted to impose a stress on said dielectric of greater than about 1,000 volts per mil thickness, at least one of said electrodes comprising a composite metal coating on said dielectric strip, said composite metal coating including first and second layers of different metals, said first metal layer having a thickness which provides a resistance in the range of 4 to 7 ohms per square, said second metal layer having a thickness which provides a resistance of less than about 10 ohms per square, said second metal layer being vapor deposited at a uniform thickness of less than about 20 A° to 40 A° to provide electrical continuity throughout, said metal of said second metal layer having a higher melting point than said metal of said first metal layer.

4,482,932

KEYBOARD SWITCH

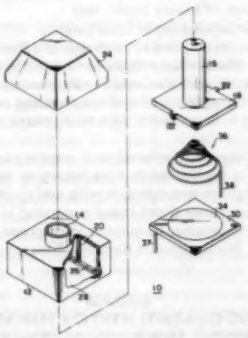
Hiroshi Hasegawa, Urawa, Japan, assignor to Topre Corporation, Tokyo, Japan

Filed Oct. 19, 1981, Ser. No. 312,724

Claims priority, application Japan, Jul. 30, 1981, 56-119819; Sep. 9, 1981, 56-142118

Int. Cl.³ H01G *5/01*

U.S. Cl. 361—288 **11 Claims**



1. A keyboard switch comprising:

an insulating substrate;

a first electrode fixed to one surface of the insulating substrate;

a second electrode fixed to said one surface of the insulating substrate and positioned apart from the first electrode;

a dielectric formed on the first and second electrodes;

an auxiliary electrode formed on a conical coil spring having a large diameter end portion and a small diameter end portion, said large diameter end portion in contact with

the dielectric, and the conical coil spring being circular in cross-section, said large diameter end portion thereof being greater in size than a combination of said first and second electrodes thereby to bridge said first and second electrodes; and

a button mounted on the small diameter end portion of said auxiliary electrode and capable of moving toward said insulating substrate.

4,482,933

MULTILAYER DOPED CERAMIC CAPACITOR

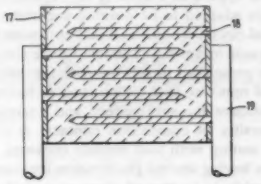
John H. Alexander, Bishop's Stortford, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,471

Claims priority, application United Kingdom, Jul. 30, 1981, 8123349

Int. Cl.³ H01G *4/10, 7/00*

U.S. Cl. 361—321 **10 Claims**



9. A multilayer ceramic capacitor, comprising

a stacked array of dielectric ceramic layers bounding voids therein voids therein, said layers having been fired from a precursor body from which a gugitive electrode material convertible into a low viscosity material at the firing temperature has been caused to escape to form said voids, whereupon said precursor body had a layer of dopant material applied thereto and was heated to cause migration of the dopant material into the body; and

a plurality of electrodes interleaved between said layers and filling said voids, said electrodes consisting of a material impregnated into said voids of said array of doped layers.

4,482,934

TEMPERATURE COMPENSATING TITANATE CERAMIC CAPACITOR WITH NICKEL OR COPPER ELECTROLESS METAL ELECTRODES

Toshiharu Hirota, Hikone; Osamu Kano, Nagaokakyo, and Yoshiharu Kato, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 25, 1983, Ser. No. 516,744

Claims priority, application Japan, Jul. 26, 1982, 57-130886

Int. Cl.³ C04B *35/46*

U.S. Cl. 361—321 **14 Claims**

1. A temperature compensating ceramic capacitor comprising a ceramic dielectric composition for temperature compensation consisting essentially of 64 to 70.5% by weight of $SrTiO_3$, 28 to 34% by weight of $CaTiO_3$, and 1.5 to 4.5% by weight of Bi_2O_3 or $Bi_2O_3.nTiO_2$ (where n=1 to 5), said composition having a dielectric constant above 235, Q above 2,000 and a temperature coefficient of a dielectric constant up to -1000×10^{-6}/°C., and nickel or copper electroless metal electrodes attached to said commposition.

2. The temperature compensating ceramic capacitor of claim 1 wherein said ceramic dielectric composition for temperature compensation contains $MgTiO_3$ in an amount of not more than 10% by weight.

4,482,935

CERAMIC CAPACITORS AND DIELECTRIC COMPOSITIONS

Jennifer M. Wheeler, London, England, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 388,571, Jun. 14, 1982, abandoned. This application Apr. 17, 1984, Ser. No. 600,601

Claims priority, application United Kingdom, Jul. 3, 1981, 8120605

Int. Cl.³ H01G *4/12*; C04B *35/46*

U.S. Cl. 361—321 **9 Claims**

1. A dielectric composition capable of being fired at a temperature between 950° and 1100° C., consisting essentially of:

lead magnesium niobate having the formula $Pb(Mg_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$ constituting between 60% and 99% by weight of the composition; and

at least one member selected from the group consisting of lead titanate, lead stannate, and lead zirconate constituting between about 1% and 40% by weight of the composition.

4,482,936

DRAWER TYPE ENCLOSED SWITCHBOARD WITH AUTOMATIC GROUNDING DEVICE

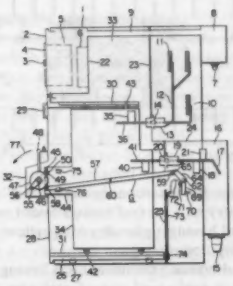
Kouji Saito, Togitsu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 16, 1983, Ser. No. 475,763

Claims priority, application Japan, Mar. 31, 1982, 57-55835

Int. Cl.³ H02B *1/04*

U.S. Cl. 361—336 **3 Claims**



1. A drawer type enclosed switchboard adapted to be automatically grounded, comprising:

a switchboard proper which has a separate switchboard in its front;

an outer truck device which is fastened to said switchboard and which is drawably received in said switchboard proper;

an inner truck device which is movably placed on said outer truck device;

a contactor on a power supply side of a main circuit, which is mounted on said switchboard proper;

a conductor on the load side of the main circuit, which is mounted on said inner truck device and which is brought into and out of engagement with the main circuit power supply side contactor in accordance with the movement of said inner truck device;

an operating handle grip which is attached to a turning shaft mounted on said switchboard;

a rotary arm for operating said inner truck device, which has one end part thereof fastened to said turning shaft and is provided at the other end part thereof with a guide pin held in engagement with a guide rail slot formed in said inner truck device and which moves said inner truck device on said outer truck device in accordance with a turning operation of said operating handle grip;

a grounding device which includes a stationary grounding terminal and a movable lever grounding blade which are disposed on said grounding device proper and which are openable and closable therebetween, and a movable lever for a grounding operation that has one end part thereof held in engagement with said grounding blade and that has a turning fulcrum thereof supported by said inner truck device; and

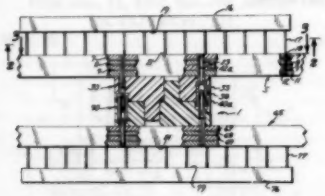
a rotary arm for the grounding operation, which has one end part thereof fastened to said turning shaft of said switchboard and is provided at the other end part thereof with a movable pin that is engageable with and disengageable from said movable lever and which closes said grounding device by coming into engagement with said movable lever for the grounding operation after the engagement between the main circuit power supply side contactor and the main circuit load side conductor has been released in accordance with the turning operation of said operating handle grip.

4,482,937

BOARD TO BOARD INTERCONNECT STRUCTURE

William C. Berg, Stillwater, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 431,894
Int. Cl.³ H05K 1/14
U.S. Cl. 361—413 **2 Claims**



1. An assembly for interconnecting a first circuit board containing circuitry to a second circuit board containing circuitry, each board having a plurality of apertures for receiving pins, said assembly comprising:

first and second housing members each having a flat surface for abutting a surface of one of said circuit boards, an alignment projection, an alignment cavity, a plurality of socket apertures and a like plurality of pin apertures, said first and second housing members being identically configured and being mutually assemblable so that when the alignment projection of one member mates with the alignment cavity of the other member the pin apertures of each member confront the socket apertures of the other member;

a socket contact supported within each socket aperture, each socket contact having an electrically conductive pin portion and an electrically conductive socket end, the pin portion of each socket contact extending beyond the flat surface of the respective housing member and being frictionally engagable to a respective aperture of one said circuit boards; and

a pin contact supported within each pin aperture, each pin contact having an electrically conductive pin portion and an electrically conductive flex contact, the pin portion of each pin contact extending beyond the flat surface of the respective housing member and being frictionally engagable to a respective aperture of one of said circuit boards, each flex contact being frictionally engagable to a respective socket end of a socket contact when said first and second housing members are mated;

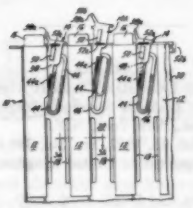
whereby identically configured housing members supporting socket contacts and pin contacts may be mutually engagable to interconnect said first and second circuit boards.

4,482,938

ELECTRICAL APPARATUS WITH PLUG-IN MODULES

Alexander R. Norden, 350 Central Park West, New York, N.Y. 10025

Filed Aug. 27, 1982, Ser. No. 412,179
Int. Cl.³ H05K 7/10
U.S. Cl. 361—426 **19 Claims**



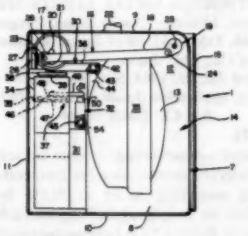
1. Electrical apparatus including an enclosure, at least one circuit module adapted to be inserted and removed from the enclosure, said circuit module and said enclosure having cooperating first guide means for constraining the circuit module to move along a prescribed in-and-out path for installation in the enclosure and removal, said circuit module having a plurality of module contacts at a side thereof, and a terminal assembly having a plurality of companion contacts at a side thereof disposed for mating with said module contacts, respectively, said apparatus having second guide means for constraining said terminal assembly to be moved along an in-and-out path that slants at an acute angle to the in-and-out movement of said circuit module such that, when the circuit module and the terminal assembly are in their operative positions, the module contacts are engaged by said companion contacts of the terminal assembly and, as said terminal assembly is drawn from its operative position outward along said slant angle, it attains a forward position wherein its companion contacts are separated from said module contacts and the circuit module can be removed from the enclosure and/or installed therein along its in-and-out path without engagement of the module contacts with the terminal assembly contacts.

4,482,939

DIRECTIONALLY VARIABLE LIGHTING ASSEMBLY

Andrew Tishman, 144 E. 84th St., New York, N.Y. 10028

Filed Jun. 27, 1983, Ser. No. 507,980
Int. Cl.³ B60Q 1/00
U.S. Cl. 362—64 **30 Claims**



1. An apparatus for containing a headlight, comprising:

(a) an enclosure having at least one opening therein;

(b) frame means for containing the headlight so that the headlight faces the opening;

(c) gimbal means attached to the frame means and pivotally engaging mount means associated with the enclosure;

(d) first operator means pivotally connected between first

drive means associated with the enclosure and the operative combination comprising the frame means and the gimbal means; and

(e) second operator means pivotally connected between second drive means associated with the enclosure and the operative combination comprising the frame means and the gimbal means.

4,482,940

INTERIOR LIGHTING WITH A ROTARY SWITCH

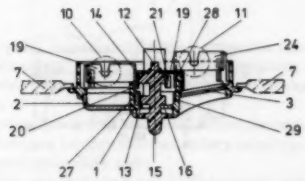
Rolf Brandherm, Gütersloh, Fed. Rep. of Germany, assignor to Wastfälische Metall Industrie KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Continuation of Ser. No. 357,702, Mar. 12, 1982, abandoned. This application Nov. 18, 1983, Ser. No. 553,419

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116757

Int. Cl.³ H02H *3/00*; H01H *21/00*

U.S. Cl. 362—74 **3 Claims**



1. Interior lighting system for motor vehicles comprising:

a housing; overall-illumination glass means and reading-light glass means held by said housing;

a projection on one side of said housing and projecting into the interior of the housing for holding a spring clip;

lugs on another side of said housing and cooperating with said spring clip to fasten the housing to an inside surface of a motor vehicle roof;

a spring contact snapped into a side of the housing opposite said spring clip and having a substantially bent tap between ends of said spring contact; said spring contact having one terminal end for one lamp to light overall the interior of said vehicle, said spring contact having another terminal end for another lamp to provide reading light;

rotary switch means mounted on the outside of said housing between said lamps, said switch having a plastic shaft substantially perpendicular to the inside roof surface of the vehicle;

two cams and knob means mounted on said shaft, said cams being angularly displaced relative to each other by a predetermined angle, said shaft being installable from in front of the housing through an opening thereof, said opening having a shape conforming substantially to outer contours of said cams;

two catches in the path of one of said cams and abutted by said one cam;

lamp mounting means lying against said other cam and holding said shaft;

two spring contacts comprised of U-shaped metal strip gripping said other cam;

a third spring contact of U-shaped metal strip gripping said one cam and having a free contact end and another end cooperating with cam notches, each U-shaped metal strip snapping into said housing to contact tap connections inserted into said housing; said lamp mounting means mounting one lamp; another lamp mounting means for mounting said other lamp;

each lamp mounting means having a bent section comprising a fixed contact for said spring contacts and lying against a wall of said housing adjacent to said spring contacts, said spring contacts lighting selectively said lamps dependent on the angular position of said knob and said shaft, to provide either overall-illumination or reading light.

4,482,941

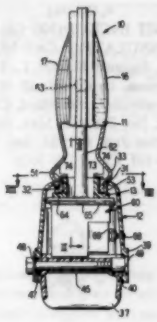
BARRIER LIGHT ASSEMBLY

Henry Lindner, Elgin, Ill., assignor to Elgin Molded Plastics, Elgin, Ill.

Filed Nov. 15, 1983, Ser. No. 551,969

Int. Cl.³ F21L *7/00*

U.S. Cl. 362—186 **8 Claims**



1. A weatherable barrier light assembly comprising in combination:

(A) a lens assembly comprising:

(1) a pair of substantially identically configured lens halves which are matingly and abuttingly engaged with one another along opposed peripheral edge portions to define an interior chamber therebetween,

(2) at least one of said lens halves being comprised of a substantially transparent material,

(3) each of said lens halves having an integral, hemi-cylindrical, internally threaded neck half extending radially outwardly from a region of said edge portion thereof,

(4) each said hemi-cylindrical neck half cooperating with the other thereof in an engaged said lens assembly to provide a cylindrical neck radially outwardly projecting from said peripheral edge portions and wherein a first pair of discrete screw thread spirals extend continuously about internal circumferential walls of such neck generally in an axially equally spaced relationship to one another, one of said screw flights starting in a radially outer edge portion of said neck at a first location which is opposed 180° relative to said neck relative to a second location in said outer edge portion where the other of said screw flights starts, and

(5) fastening means for fastening together said lens halves in said engagement;

(B) a case assembly comprising:

(1) an upper portion and a lower portion, the perimeter region of one of said portions being matingly engaged with the perimeter region of the other of said portions, said portions defining an interior chamber therebetween,

(2) securing means for fastening together said portions in said engagement, and

(3) said upper portion having an upwardly opening hole defined therein with supporting means circumferentially extending thereabout;

(C) a collet member comprising:

(1) a cylindrical shank,

(2) an integral radially outwardly projecting head flange, and

(3) a second pair of discrete screw threads extending spirally and continuously about outer circumferential walls of said shank generally in axially equally spaced

relationship to one another, said second pair of screw threads being threadably and matingly engageable with said first pair of intertwined screw flights; and

(D) the interrelationship between said lens assembly, said case assembly, and said collet member being such that, in the assembled said barrier light assembly, said neck is extendable into said hole, said shank is so threadably engageable with said neck, and said head flange in torquable into abutting retaining engagement with said supporting means.

4,482,942

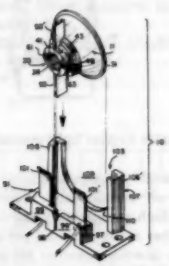
PROJECTION UNIT INCLUDING GLASS REFLECTOR WITH INSULATIVE CAP MEMBER

Ronald G. Blaisdell, Saugus; Harold L. Hough, Beverly, and Richard B. Martenson, Lynnfield, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 248,168, Mar. 30, 1981, abandoned. This application Jun. 4, 1984, Ser. No. 616,797

Int. Cl.³ F21V 9/00

U.S. Cl. 362—293 **28 Claims**



1. A projection unit for being positioned within a holder adapted for being electrically connected to the electrical circuitry associated with a projection system, said projection unit comprising:

a glass reflector having a forward reflecting portion including an internal, substantially concave reflecting surface and an apex portion having an opening therein;

an incandescent lamp including an envelope portion having a filament structure therein and a sealed end portion adjacent said envelope portion and including a pair of spaced-apart lead-in wires projection therefrom, said incandescent lamp positioned within said glass reflector such that said envelope portion of said lamp is located substantially within said forward reflecting portion relative to said concave reflecting surface, and said sealed end portion of said lamp is located substantially within said rear opening within said apex portion; and

a plastic cap member for being positioned within said holder and including an aperture therein, said cap member being fixedly secured to an external surface of said reflecting portion of said glass reflector in an abutting manner immediately adjacent said opening within said apex portion such that said aperture of said plastic cap member is coaxially aligned with the optical axis of said glass reflector to thereby align said plastic cap member in a predetermined manner with said internal substantially concave reflecting surface of said reflector, said sealed end portion of said lamp being centrally disposed within said aperture of said plastic cap member in a fixed manner prior to said fixedly securing of said plastic cap member to said glass reflector and thereby oriented relative to the surfaces of said cap member which abut said glass reflector and also to said internal, substantially concave reflecting surface of said glass reflector so as to be precisely oriented with respect to said reflector, said cap member including a pair of electrical contacts spacedly located therein, each of said electrical contacts electrically connected to a respective one of said lead-in wires projecting from said sealed end portion of said incandescent lamp, said reflecting surface of said glass reflector including a dichroic coating thereon which enables infrared radiation to pass therethrough while reflecting visible light whereby heat from said lamp will pass through said reflecting portion of said reflector.

4,482,943

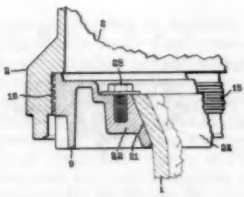
TEMPERED GLASS GLOBE

Marcus P. Hogue, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1983, Ser. No. 564,117

Int. Cl.³ F21S 1/10

U.S. Cl. 362—363 **6 Claims**



1. A tempered glass globe comprising a glass vessel having a bowl portion merging into a flaring rim portion which is circular in cross-section,

the walls of said globe being at least ¼ inch thick and substantially uniform in thickness throughout both portions,

said rim portion making an angle of taper with the vertical in the range of 15° to 45°,

said rim portion defining a section of a conical surface for making a nonflame-propagating joint with a member having a mating conical surface.

4,482,944

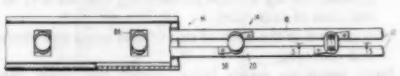
FLEXIBLE LIGHT STRIP ASSEMBLY

Isaiah C. Roossine, and Willem Wirtz, both of 228 Phipps Plz., Palm Beach, Fla. 33480

Filed Feb. 18, 1983, Ser. No. 467,848

Int. Cl.³ F21S 1/02, 3/02

U.S. Cl. 362—418 **41 Claims**



1. A socket for a bulb having a wedge base, comprising:

a housing having two substantially identical halves, a longitudinal axis, and a bulb-receiving cavity adapted to receive the bulb substantially parallel to said axis;

means for fastening said housing halves together; and

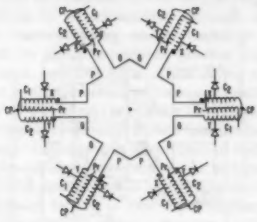
first and second substantially identical electrical contacts in said housing, said contacts being electrically separated and disposed within said housing such that each contact is oriented approximately 180° with respect to the other, measured about said axis, each of said contacts terminating in a foot substantially perpendicular to said axis, said foot of said first contact extending in a substantially opposite direction from said foot of said second contact.

4,482,945

TRANSFORMER FOR LOW DISTORTION RECTIFIER SYSTEM

Joachim E. Wolf, Monroeville; Paul H. Watson, Ardara, and Raymond J. Radus, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 29, 1982, Ser. No. 445,124
Int. Cl.[3] H02M 7/155
U.S. Cl. 363—129 15 Claims



1. In a 12-pulse transformer/rectifier apparatus for converting three-phase AC to DC, from a three-phase primary through a twelve-phase hexagonally distributed secondary, the combination of :

two half primary winding associated across the opposite side of the hexagon to respective secondary windings, to form six primary-secondary coils,

each of said coils including two half secondary windings of same height as said half primary winding having a common point at one end, having a start and a finish lead at the opposite end, said half-primary winding being sandwiched between said two half secondary windings;

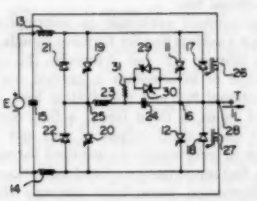
said coils being distributed by pairs on three legs of a magnetic core so that the coils of one pair belong to opposite sides of the hexagon and are oriented in opposition on the same leg, but symmetrically in relation to the central leg of the magnetic core.

4,482,946

HYBRID INVERTER

Pradeep M. Bhagwat, Baltimore, Md., assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Sep. 27, 1982, Ser. No. 424,759
Int. Cl.[3] H02M 7/515
U.S. Cl. 363—136 11 Claims



1. A hybrid inverter having at least one leg to provide at least a single phase output, each inverter leg comprising:

a pair of thyristor means connected in series across a dc source with a juncture between the thyristors for connection to a load, to control current flow to the load during preselected periods;

thyristor commutation means for commutating thyristors in either of the thyristor means; and

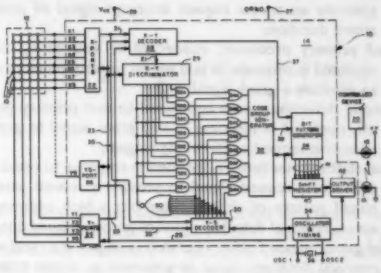
transistor means connected across each of the thyristor means to control current flow to the load during other preselected periods.

4,482,947

MULTI-FUNCTION, MULTI-UNIT REMOTE CONTROL SYSTEM AND METHOD THEREFOR

Thomas J. Zato, Palatine, and Peter C. Skerlos, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 12, 1982, Ser. No. 367,827
Int. Cl.[3] G05B 19/00
U.S. Cl. 364—138 12 Claims



8. A method for selectively controlling various functions in a plurality of devices responsive to remotely generated multi-bit digitally coded control signals, said method comprising:

generating a composite coded signal in response to a single user input, said composite coded signal including address and function indicia for selectively accessing one of said devices and for controlling one of said functions in said accessed device, respectively;

decoding said composite signal and extracting said address and function indicia therefrom;

generating a ternary digital signal in response to said decoded address and function indicia, said ternary digital signal comprised of a plurality of information elements having three possible states and arranged in a plurality of predetermined combinations; and

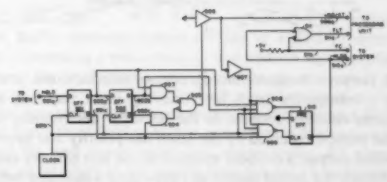
transmitting said ternary digital signal to said plurality of devices with each device responsive to only one of said predetermined combinations of said information elements for selectively controlling one of said functions in one of said devices.

4,482,948

MICROPROCESSOR BUS INTERCHANGE CIRCUIT

James R. Holden, Chicago, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 29, 1980, Ser. No. 220,936
Int. Cl.[3] G06F 13/00
U.S. Cl. 364—200 8 Claims



1. A bus interchange circuit for use with a primary processing unit, and a secondary processing unit, said secondary processing unit operated to generate an access request signal, said bus interchange circuit comprising:

first detection means including a source of clock pulses and a shift register having a plurality of bit registers, each connected to said source of clock pulses, a first one of said

bit registers being connected to said secondary processing unit, said shift register being operated in response to said clock pulses to sequentially clock the status of said access request signal through said shift register, whereby a first predetermined pattern of said shift register bits represents an access request detected signal of predetermined duration;

gating means connected to said first detection means, operated in response to said access request detected signal to generate an access request interrupt signal of predetermined duration;

said primary processor, connected to said gating means, operated in response to said access request interrupt signal to generate a grant signal; and

second detection means connected to said primary processor, operated in response to said grant signal to generate an access request acknowledge signal;

said shift register further operated in response to removal of said access request signal to provide a second predetermined pattern of shift register bits which represent an access removal detected signal of predetermined duration;

said gating means further operated in response to said access removal detected signal to generate an access complete interrupt signal; and

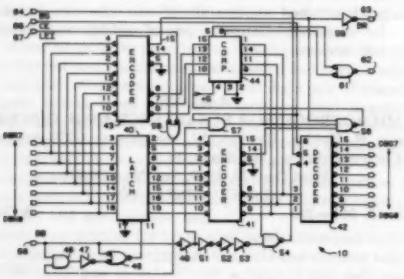
said second detection means further connected to said first duration means and further operated in response to said access removal detected signal to terminate said access request acknowledge signal.

4,482,949

UNIT FOR PRIORITIZING EARLIER AND LATER ARRIVING INPUT REQUESTS

Ronnie L. Cates, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 20, 1981, Ser. No. 284,757
Int. Cl.³ G06F *3/04, 9/46*
U.S. Cl. 364—200 **4 Claims**



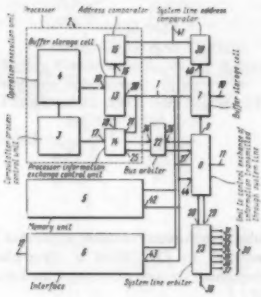
1. An asynchronous microprocessor interface unit, comprising: a transparent latch for receiving input requests; a first priority encoder coupled to the latch for determining which input request received by the latch has priority and providing a coded output; a decoder coupled to the first priority encoder to decode the coded output and providing a decoded output; a second priority encoder for also receiving the input requests and providing a coded output corresponding to the highest priority input request received; and a comparator coupled to the first and second encoders for comparing the outputs of the first and second encoders to establish a priority therebetween so that a later arriving input request which has a higher priority than an input request already processed by the first encoder can be determined.

4,482,950

SINGLE-CHIP MICROCOMPUTER

Valery L. Dshkhunian, K-482, korpus 338A, kv. 73; Eduard E. Ivanov, 14 Parkovaya ulitsa, 16, kv. 6; Sergei S. Kovalenko, k-498, korpus 421, kv. 3; Pavel R. Mashevich, k-482, korpus 338A, kv. 139, and Jury E. Chicherin, K-460, korpus 161, kv. 31, all of Moscow, U.S.S.R.

Filed Sep. 24, 1981, Ser. No. 307,942
Int. Cl.³ G06F *13/00, 9/22*
U.S. Cl. 364—200 **4 Claims**



1. For use in a multi micro-computer system, a single-chip micro-computer having a first input, a second input, a first input/output, a second input/output, a third input/output, and a group of inputs and outputs, comprising:

a processor for data processing:

an operation execution unit of said processor, an input/output of said operation execution unit;

a computation process control unit of said processor connected to said operation execution unit of said processor for decoding instructions and generating a sequence of control micro-instructions; an output of said computation process control unit;

a memory unit; an input of said memory unit;

an interface connecting the single-chip micro-computer to peripheral devices; an input/output of said interface which is said third input/output of said single-chip micro-computer; an input of said interface;

a buffer storage cell; an output and a control input of said buffer storage cell; an input/output of said buffer storage cell which is said first input/output of said single-chip micro-computer;

a bidirectional bus;

a unit to control exchange of information transmitted through a system line for forming signals to control said buffer storage cell and determine the order in which exchange of information is carried out through said bidirectional bus and said system line; a first input, a second input, a third input, a first output, a second output and a third output of said unit to control exchange of information transmitted through the system line; a first input/output of said unit to control exchange of information transmitted through the system line which is said second input/output of the single-chip micro-computer;

said bidirectional bus interconnecting said processor, said memory unit, said interface, said buffer storage cell and said unit to control exchange of information transmitted through the system line;

said first output of said unit to control exchange of information transmitted through the system line being connected to said control unit of said buffer storage cell;

the improvement consisting in that said processor contains:

a buffer storage cell of the processor for temporarily storing and transmitting of data and data addresses

through said bidirectional bus to said first input/output of the single-chip micro-computer; a control input of said buffer storage cell of said processor; a first input/output of said buffer storage cell of said processor connected to said input/output of said operation execution unit; a second input/output of said buffer storage cell of said processor connected to said bidirectional bus;

a processor information exchange control unit to control said buffer storage cell of said processor and to form data and data address accompanying signals and identifiers to be transmitted through said bidirectional bus according to an exchange instruction formed by said computation process control unit; a first input, a second input, a first output and a second output of said information exchange control unit; and input/output of said processor information exchange control unit connected to said bidirectional bus;

an address comparator to select units of said single-chip micro-computer according to an address stored by said buffer storage cell of said processor, said address comparator having a first input connected to said buffer storage cell of said processor; a second input of said address comparator;

said output of said computation process control unit being connected to said first input of said processor information exchange control unit; said first output of said processor information exchange control unit being connected to said control input of said buffer storage cell of said processor;

said single-chip micro-computer further containing:

a bus arbiter to select a priority unit which requests for a cycle of exchange through said bidirectional bus and to form at its outputs enabling signals to borrow an exchange cycle on said bidirectional bus, said bus arbiter being connected to said second output of said processor information exchange control unit and to said second output of said unit to control exchange of information transmitted through the system line, a first input and a first output of said bus arbiter connected to second output and second input, respectively, of said processor information exchange control unit; a second input and a second output of said bus arbiter connected to said second output and said second input, respectively, of said unit to control exchange of information transmitted through the system line;

a system line arbiter to resolve conflicts between the micro-computers when reference is made to the system line; a first input and a first output of said system line arbiter connected to said third output and said second input of said unit to control exchange of information transmitted through the system line; a second input of said system line arbiter which is said first input of said single-chip micro-computer;

a group of inputs and outputs of said system line arbiter which is said group of inputs and outputs of said single-chip micro-computer; a first input, a second input, a third input, a fourth input, a first output, a second output and a third output of said group of inputs and outputs of said system line arbiter;

a system line address comparator to select units of said single-chip micro-computer according to an address stored by said buffer storage cell; a first input of said system line address comparator connected to said output of said buffer storage cell; a second input of said system line address comparator, combined with said second input of said address comparator and connected to said input of said memory unit, to said input of said interface and to said third input of said unit to control exchange of information transmitted through the system line.

4,482,951

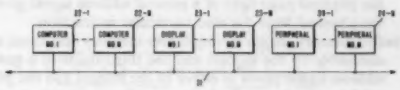
DIRECT MEMORY ACCESS METHOD FOR USE WITH A MULTIPLEXED DATA BUS

Richard E. Swaney, and William D. Long, both of Fullerton, Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Nov. 12, 1981, Ser. No. 320,244

Int. Cl.[3] **G06F** *3/04, 15/16*

U.S. Cl. 364—200 **8 Claims**



1. A method for use with a multiplexed data bus having a plurality of data processing units coupled thereto which provides for direct addressing of respective computer memories associated with each of said data processing units to store received data messages therein, said data processing units including a vector table and an input control block which are established by software functions executed by said data processing units, said data message comprising a functional address identifying a data processing function to be performed on data in said data message and data to be transferred into said memory, said method comprising:

receiving said data message containing said functional address;

using said functional address as an index in said vector table, said functional address pointing to an input control block corresponding to that particular functional address;

addressing said input control block designated by said functional address;

utilizing said input control block to designate a computer meory location where data in a received data message is to be stored; and

storing said data contained in said received data message in said computer memory location designated by said input control block.

4,482,952

VIRTUAL ADDRESSING SYSTEM USING PAGE FIELD COMPARISONS TO SELECTIVELY VALIDATE CACHE BUFFER DATA ON READ MAIN MEMORY DATA

Masanobu Akagi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,774

Claims priority, application Japan, Dec. 15, 1980, 55-176974; Jan. 9, 1981, 56-1939

Int. Cl.[3] **G06F** *9/26, 13/00*

U.S. Cl. 364—200 **9 Claims**

1. A buffer memory system for use in a data processing system comprising a main memory and address signal producing means for producing a general address signal given in one of logical and physical forms for each of a plurality of instructions for accessing said main memory and comprising a first, a second and a third field at higher order bits, at least one intermediate bit, and lower order bits, respectively, the general address signal given in the logical form for one of said instructions having a logical page field for specifying one of a plurality of pages, the general address signal given in the physical form for said one instruction having a physical page field for specifying said one page, each of said logical and said physical page fields comprising the first and the second fields, the third field of a general address signal comprising each of said logical and said physical page fields being for specifying one of a plurality of block addresses in said one page, said main memory

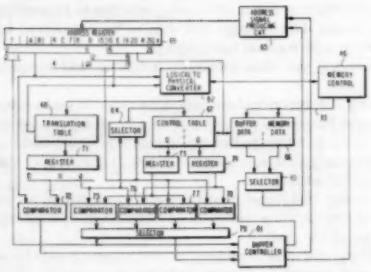
having main memory addresses for storing a data block at the main memory address accessible by the page and the block address specified by a general address signal given in the physical form, said buffer memory system comprising:

address translating means for translating the logical page field of a general address signal given for each instruction to the physical page field of a general address signal given for the instruction under consideration;

translation table means having translation table addresses, each accessible by the first and the second fields of a general address signal given in either of the logical and the physical forms for a particular instruction for memorizing the physical page field of a general address signal given in the physical form for said particular instruction;

buffer memory means having buffer memory addresses, each accessible by the second and the third fields of a general address signal given in either of the logical and the physical forms for a specific instruction for memorizing a copy of the data block stored in the main memory address accessible by the page and the block address specified by a general address signal given in the physical form for said specific instruction;

control table means having control table addresses, each accessible by the second and the third fields of a general address signal given in either of the logical and the physical forms for said specific instruction for memorizing the physical page field of the general address signal given in the physical form for said specific instruction;



first means responsive to the first and the second fields of a general address signal currently produced by said address signal producing means in either of the logical and the physical forms for reading the physical page field from said translation table means and responsive to the second and the third fields of the currently produced general address signal for reading the data block from said buffer memory means and the physical page field from said control table means;

second means having inputs responsive to the outputs of said translation table means and control table means and the physical page field of the currently produced general address signal for comparing one of the physical page field of the currently produced general address signal and the physical page field read from said translation table means with the physical page field read from said control table means to produce a comparison result signal indicative of whether the compared physical page fields are in coincidence of incoincidence with each other;

third means responsive to the comparison result signal produced by said second means for judging that the data block read from said buffer memory means is effective only when the comparison result signal is indicative of the coincidence;

fourth means responsive to the comparison result signal indicative of the incoincidence for reading the data block from the main memory address accessible by the third field of the currently produced general address signal and that pertinent one of the physical page fields read from said translation table means and of the currently produced general address signal according to whether the currently produced general address signal is given in the logical form or the physical form; and

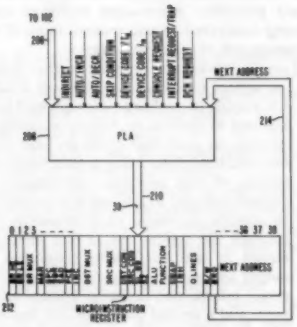
fifth means for making the buffer memory address, accessible by the second and the third fields of the currently produced general address signal, memorize the data block read from said main memory and for making the control table address, accessible by the second and the third fields of the currently produced general address signal, memorize said pertinent one of the physical page fields.

4,482,953

COMPUTER WITH CONSOLE ADDRESSABLE PLA STORING CONTROL MICROCODE AND MICROINSTRUCTIONS FOR SELF-TEST OF INTERNAL REGISTERS AND ALU

Gary R. Burke, Cupertino, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 155,152, May 30, 1980, abandoned.
This application May 23, 1983, Ser. No. 495,735
Int. Cl.³ G06F 9/22, 11/00
U.S. Cl. 364—200 **8 Claims**



1. A computer comprising:

an information bus for connection to an external memory containing a user program in a plurality of memory locations and for connection to a console;

a plurality of internal registers and multiplexers and a program counter coupled to said information bus;

an arithmetic logic unit for doing arithmetic and logical functions and coupled to said information bus via said multiplexers and registers;

a programmable logic array (PLA) for coupling to said console via said information bus and coupled to said internal registers, said program counter, said multiplexers and said arithmetic logic unit, said PLA having microcode stored therein, said PLA also for receiving a selected, predetermined code word from said console on said information bus thereby causing said PLA to generate a predetermined sequence of microinstructions to be executed by said computer to cause a selected one of several events to occur, said events including, writing data to or reading data from any of said internal registers, or any location in said external memory, or said program counter, said PLA also for executing a self-test sequence of microinstructions upon receipt of a predetermined code word from said console said test routine for testing the ability of a majority of the registers, multiplexers and data paths to function correctly and for testing a majority of the arithmetic and logical functions of said arithmetic logic unit.

4,482,954

SIGNAL PROCESSOR DEVICE WITH CONDITIONAL INTERRUPT MODULE AND MULTIPROCESSOR SYSTEM EMPLOYING SUCH DEVICES

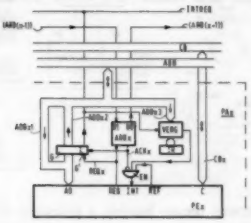
Hendrik Vrielink; Eduard M. A. M. van der Ouderaa, and Adriaan Willemse, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 189,285, Sep. 22, 1980, abandoned. This application Aug. 9, 1983, Ser. No. 521,025

Claims priority, application Netherlands, Sep. 27, 1979, 7907179

Int. Cl.³ G06F *15/16, 13/00*

U.S. Cl. 364—200 6 Claims



1. A signal processor device having a processor module for use in a multiprocessor system with distributed interrupt handling by at least more than one processor device, said processor module having address, data and control inputs and outputs, including an interrupt signal input for receiving an incoming interrupt request signal, comprising: at least one conditional interrupt means for comparing an identity address of said processor module upon detecting address coincidence;

said conditional interrupt means being provided with:

input means for receiving an external interrupt request signal with corresponding destination address;

comparator means connected to said input means for comparing its own identity address with said destination address upon receiving said external interrupt request signal;

output means for said comparator for transmitting a coincidence signal to said processor module when it has been established that the two said addresses are in agreement;

a first gating means for gating said coincidence signal to be conditionally applied to the interrupt signal input of said signal processor module; and wherein said signal processor device has an interrupt signal output means for transmitting an outgoing interrupt request signal to outside said device characterized in that:

said conditional interrupt means is further provided with a second gating means for passing an outgoing destination address from said processor module corresponding to the outgoing interrupt request; and wherein said second gating means includes a control input means serving for receiving an acknowledge signal indicating that the outgoing interrupt request has been acknowledged;

and said signal processor device further including:

an arbitration means having a first input for receiving a first external acknowledge signal from outside the device and a second input for passing on an outgong interrupt request signal from said processor module;

and said arbitration module generating a second internal acknowledge signal if said two signals are present at a first output of said arbitration means, which second acknowledge signal is fed to control input means of said second gating means with which the outgoing interrupt request signal and the destination address are released, and at a second output of said arbitration means a third outgoing acknowledge signal appears if, upon receipt of the said first external acknowledge signal, no outgoing interrupt request signal from said processor module occurs.

4,482,955

DATA TRANSFER SYSTEM FOR DATA ENTRY SYSTEM

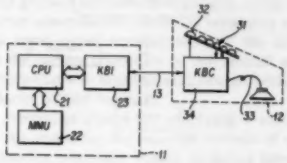
Katsumi Amano, and Takatoshi Ishii, both of Oume, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 333,773, Dec. 23, 1981,. This application Jan. 9, 1984, Ser. No. 568,513

Claims priority, application Japan, Dec. 23, 1980, 55-181396

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—200 3 Claims



1. A data transfer system comprising:

a main processor having a transmitting means and a receiving means;

a scan type keyboard having plural keys corresonding to respective key-in data, a transmitting means and a receiving means;

a bidirectional cable provided between said main processor and said keyboard;

said main processor comprising command transmitting means for periodically and serially sending commands from said transmitting means of said main processor to said receiving means of said keyboard through said cable and control means for assigning use of said cable to said keyboard for a time period until said processor receives a response to said commands;

said keyboard comprising processor responding means for continuously scanning said keys to detect a key actuation, for generating and storing the key-in data corresponding to an actuated key upon detection of said actuated key, and for sending said key-in data as response signals from said transmitting means of said keyboard to said receiving means of said main processor through said cable after said main processor assigns use of said cable to said keyboard during said time period; and

said control means provided for using said bidirectional cable in a half duplex mode wherein said main processor sends said commands to said keyboard and said keyboard then sequentially responds by sending said response signals from said keyboard to said main processor.

4,482,956

PARALLEL QUEUEING METHOD

Peter H. Tallman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1982, Ser. No. 438,993

Int. Cl.³ G06F *1/00*

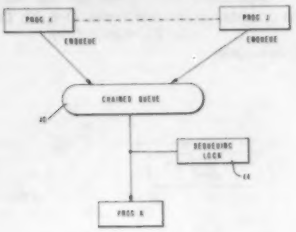
U.S. Cl. 364—300 6 Claims

1. A method of controlling a queue of address chained elements beginning with an anchor-pointed element, each element comprising a block of bytes located in a main storage any where relative to any other element in the queue, the main storage being in a data processing system having one or more CPU's, each element containing a pointer to a next element in the queue except the last element in the queue containing an end of queue indicator, the queue having an anchor block containing an anchor-pointer for providing an address that directly enables the addressing of an anchor-pointed element, a plurality of processing being capable of simultaneous execution in the system, comprising:

providing a dequeueing lock for permitting the dequeueing of any element in the queue,

obtaining the dequeueing lock in a set-on state prior to deletion of any element in the queue,

ignoring the state of the dequeueing lock for the insertion of an anchor-pointed element into the queue by a compare and swap type of CPU instruction,



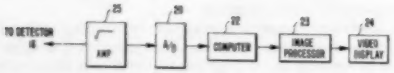
whereby a plurality of simultaneously executing processes may be inserting anchor-pointed elements into the queue while another simultaneously executing process may be deleting any element in the queue.

4,482,957

USE OF A SQUARE ROOT AMPLIFIER FOR STATISTICS LIMITED DATA

Paul J. Bjorkholm, Sharon, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Nov. 4, 1981, Ser. No. 318,235
Int. Cl.³ G06F *7/552, 15/42*
U.S. Cl. 364—414 **4 Claims**



1. A method for minimizing the data storage requirement of a detected quantum noise limited signal comprising the steps:

detecting the photons of an analog quantum limited signal wherein the standard deviation thereof is proportional to the square root of the number of detected photons;

subjecting the detected signal to square root amplification;

performing an analog-to-digital conversion on the signal after the amplification for transforming the magnitude of quantum noise fluctuations to a constant voltage value, independent of signal attenuation; and

storing the converted signal;

wherein a single bit change of stored data represents a constant fraction of a standard deviation independent of signal intensity.

4,482,958

DATA PROCESSING DEVICE FOR COMPUTED TOMOGRAPHY SYSTEM

Nobutoshi Nakayama, Nishinasumo; Yukinobu Ito; Eitaro Nishihara, both of Otawara; Kazuhide Iwata, and Shigeki Shibayama, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 12, 1981, Ser. No. 320,566
Claims priority, application Japan, Nov. 17, 1980, 55-160908
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—414 **15 Claims**

14. An apparatus for reconstructing a two-dimensional image created by radiation of a fan-shaped beam irradiated from a plurality of angles in an object to be examined and through said object onto detector elements adjacent to each other at which a multiplicity of signals are received at said plurality of angles, said apparatus comprising:

first processing means for generating back-projection data based on the signals received by the detector elements at said angles;

second processing means for summing a set of successive back-projection data provided from said first processing means and for generating a summed data of the set of successive back-projection data;

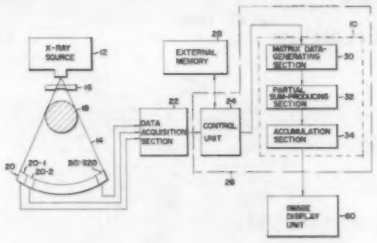


image memory means having a plurality of memory locations corresponding to said image, for storing values representative of said image;

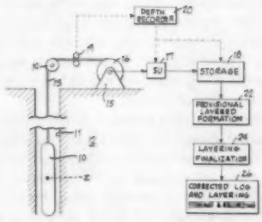
third processing means for adding the summed data provided from said second processing means to that value which results from previously summed data and is stored in said image memory means and for storing the added data in place of the value of said previously summed data for back-projection.

4,482,959

WELL LOGGING: UTILIZING SUPERPOSITION OF STEP-PROFILE RESPONSES OF LOGGING TOOLS TO IMPROVE LOGS

Jean-Claude Minne, Dubai, United Arab Emirates, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,447
Int. Cl.³ E21B *49/00*; **G06F** *15/20*
U.S. Cl. 364—422 **12 Claims**



1. A well logging process comprising the following machine-implemented steps:

deriving an original induction log produced by an induction tool passed through a borehole through a subsurface formation;

finding, from a log of the same borehole or formation which can be said original induction log, provisional bed boundary depth levels and bed conductivities of a provisional layered formation traversed by the borehole;

producing, from said provisional boundary depth levels and bed conductivities, a provisional reconstructed induction log by linearly superposing respective known step profile responses of the induction tool to conductivity step profiles consistent with respective ones of said provisional boundaries and bed conductivities;

matching the original log and the reconstructed log and refining the provisional bed conductivities and/or bed boundaries on the basis thereof until the match based on the most recent refinement meets selected criteria; and

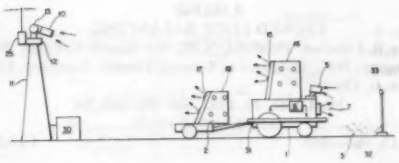
producing a tangible representation of an improved induction log based on the most recent set of refined bed boundaries and bed conductivities.

4,482,960

ROBOT TRACTORS

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Filed Nov. 20, 1981, Ser. No. 323,395
Int. Cl.[3] B62D *1/28*; G05D *1/00*
U.S. Cl. 364—424 **12 Claims**



1. A method of automatically controlling the operation of tractors, combines and other agricultural machinery in a field comprising the steps of:

sensing a characteristic of the field adjacent the machinery with a first electro-optical sensor located on the machinery;

determining a desired steering, throttle position, or other control function of the machinery from the sensed characteristic using a microcomputer located on the machinery, the microcomputer being programmed for terrain, field size, crop type, or other appropriate variable of the field;

determining the position of the machinery in the field relative to a reference point using a second electro-optical sensor and a target, one of the sensor and target being located at the reference point and the other on the machinery; and

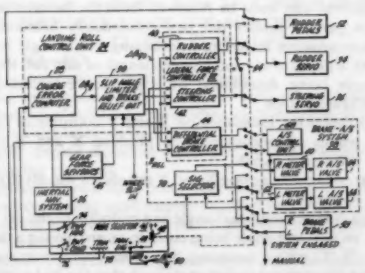
automatically actuating the steering, throttle, or other control function to guide the machinery in a desired manner of operation.

4,482,961

AUTOMATIC CONTROL SYSTEM FOR DIRECTIONAL CONTROL OF AN AIRCRAFT DURING LANDING ROLLOUT

Jerome R. Kilner, Bellevue, and Steven M. Warren, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 18, 1981, Ser. No. 303,381
Int. Cl.[3] G06F *15/00*
U.S. Cl. 364—428 **29 Claims**



1. Ground roll control apparatus for lateral control of an aircraft during execution of the landing rollout sequence on a runway, said aircraft being of the type that includes a rudder system for aerodynamically establishing lateral control, at least one steerable wheel for exerting lateral control and a braking system with left and right differentially operable left and right brakes for providing additional lateral control, said aircraft being equipped with means for supplying signals representative of the current yaw position of said aircraft, the time rate of change of said current yaw position of said aircraft, the current ground velocity slip angle of said aircraft and the velocity of said aircraft relative to the longitudinal and lateral body axis thereof, said ground roll control apparatus comprising:

course error computation means for supplying a ground roll course error signal representative of the difference between the current trajectory of said aircraft and a desired trajectory that will maintain said aircraft within the lateral boundaries of said runway;

steering controller means for supplying a steering control signal for operating the steerable wheels of said aircraft, said steering controller means including integral control means for supplying a first component of said steering control signal, said integral control means being responsive to said ground roll course error signal, said signal representative of the current ground velocity slip angle of said aircraft and said signal representative of said current yaw position of said aircraft, said steering controller further including proportional control means for supplying a second component of said steering control signal, said proportional control means being responsive to said ground roll course error signal and said signal representative of the time rate of change in said current yaw position of said aircraft, said steering controller means further including means for combining said first and second components of said steering control signal to produce said steering control signal;

rudder controller means for supplying a rudder control signal for operating said rudder system of said aircraft, said rudder controller means including integral control means for supplying a first component of said rudder control signal, said integral control means being responsive to said ground roll course error signal, said signal representative of the current ground velocity slip angle of said aircraft and said signal representative of the current yaw position of said aircraft, said rudder controller means further including proportional control means for supplying a second component of said rudder control signal, said proportional control means being responsive to said ground roll course error signal and said signal representative of the time rate of change in said current yaw position of said aircraft, said rudder control means further including means for combining said first and second components of said rudder control signal, said rudder controller means additionally including rudder authority means for receiving said combined first and second components of said rudder control signal and for supplying said rudder control signal, said rudder authority means exhibiting a gain factor that is a function of the ground roll velocity of said aircraft to supply said rudder control signal at a level that causes said rudder system to provide lateral control that dominates the lateral control provided by said steerable wheels and said braking system during a predetermined high speed portion of said landing rollout sequence; and

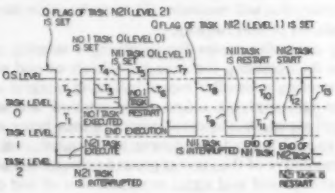
differential brake controller means for supplying a brake control signal for operating said differentially operable left and right brakes of said aircraft, said differential brake controller means being responsive to said ground roll course error signal and said signal representative of the time rate of change in said current yaw position of said aircraft to selectively reduce one of the pilot-initiated left and right brake signals by an amount proportional to a weighted sum of said signal representative of said ground roll course error signal and said signal representative of

said time rate of change in said current yaw position of said aircraft.

4,482,962
ENGINE CONTROL METHOD

Matsuo Amano; Toru Sugawara; Toshio Furuhashi, and Masumi Imai, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 181,761, Aug. 27, 1980, abandoned. This application Feb. 6, 1984, Ser. No. 577,613
Claims priority, application Japan, Sep. 5, 1979, 54-112953
Int. Cl.³ G06F *9/46*; G05B *15/02*
U.S. Cl. 364—431.11 **29 Claims**


O FLAG OF TASK N2(LEVEL 2) IS SET
O FLAG OF TASK N2 (LEVEL 1) IS SET
NO 1 TASK O(LEVEL O) IS SET
N11 TASK O(LEVEL 1) IS SET
N11 TASK IS RESTART
N12 TASK START
OS LEVEL
TASK LEVEL 0
TASK LEVEL 1
TASK LEVEL 2
NO 1 TASK EXECUTED
END EXECUTION
N21 TASK EXECUTE
N11 TASK IS INTERRUPTED
END OF N11 TASK
END OF N12 TASK
N21 TASK IS INTERRUPTED
N21 TASK IS RESTART

1. In a control system for electronically controlling the operation of an internal combustion engine said control system including sensors for detecting operating conditions of said engine, an arithmetic unit for arithmetically determining control quantities for controlling said engine through digital processing of output signals produced from said sensors, memory means for storing therein programs and data for performing said arithmetic operations, and control means for controlling said engine in response to the results of said arithmetic operation, said programs being classified as a plurality of tasks on the basis of control functions thereof, each classified task having a start period respectively set in accordance with its influence on the engine and priority level respectively;

a method of controlling the operation of said control system comprising executing said programs by performing the steps of:

A a first step of setting a start request flag into the memory means in response to the expiration of a start period,

B a second step of searching for said start request flag successively from tasks of higher levels,

C a third step of reading out a start address of the particular task on the basis of the search results of the second step,

D a fourth step of executing the particular task, setting a run flag by use of a start address and resetting the start request flag, and

E a fifth step for resetting said run flag on the basis of an end of execution of said particular task, and

F a sixth step for repating the first to fifth steps, whereby control of the operation of the system is effected by execution of said tasks in the course of performing said first through sixth steps.

6. A method of controlling the operation of a processor-controlled system in which output signals are produced as a result of the processor carrying out a plurality of tasks, the functions of which affect the operation of said system, comprising the steps of:

(a) storing, in memory, a plurality of task programs through the execution of which said tasks are performed, each task program having a prescribed program level of priority assigned thereto in accordance with its functional effect on the operation of said system, and those task programs which share the same level of priority having assigned thereto respective sub-levels of priority relative to each other;

(b) storing, in memory, task control blocks respectively associated with said program levels of priority, each task control block having a first segment the contents of which are representative of whether or not there is an execution request for each respective task program having that priority level, and a second segment representative of whether any task program having that priority level is being executed or interrupted;

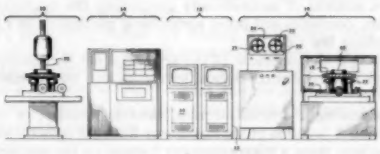
(c) searching the first segments of said task control blocks successively from higher to lower levels of priority for the presence of an execution request; and

(d) in response to step (c) finding an execution request, causing the second segment of the task control block in the first segment of which the execution request was found in step (c) to be representative of the execution of a task program the priority level of which is associated with that task control block and executing said task program corresponding to said execution request to produce output signals for controlling said processor-controlled system.

4,482,963
CLOSED LOOP BALANCING

James B. Lenahan, Pittsfield, N.H., and Arnold A. Baier, Wilmington, N.C., assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 30, 1982, Ser. No. 363,704
Int. Cl.³ G05F *15/20*
U.S. Cl. 364—463 **1 Claim**



1. A method of dynamically balancing a part of known dimensions and density, by removing material, said method comprising the steps of:

(a) providing a balance land on the part, the balance land being in the form of a circular projection which is centered around a central axis about which the part is intended to rotate;

(b) defining and storing in a computer, part dimensions and density;

(c) defining and storing in a computer a part cutting program;

(d) defining and storing said balance land inner diameter, outer diameter and thickness in said computer;

(e) measuring dynamic imbalance of the part and producing electrical error signals having a voltage proportional to the measured imbalance;

(f) converting said error signals from analog to digital format and recording the digital error signals in said computer;

(g) based on said digital error signals and said part dimensions and density, determining an amount and location of material that must be removed from the balance land of the part to render the part dynamically balanced, the determination including determining a start angle for said cut, a depth of cut and a sweep length of said cut, the start angle being determined by a procedure including the following steps

(i) measuring imbalance on X and Y coordinates in both planes of measurement to produce X and Y analog imbalance signals;

(ii) converting analog X and Y imbalance signals to digital format;

(iii) determining a mid-angle as a midpoint of the cut based on said mid-angle being equal to an arc having a tangent (X/Y) with a necessary quandrant correction; and

(iv) determining a start angle such that the mid-angle is at a midpoint of said sweep of said cutter;

(h) inserting the determined start angle, depth of cut and

sweep length into an appropriate portion of said part cutting program, and

(i) executing the modified part cutting program with said controller on a controlled cutting machine to cut the part and render the part dynamically balanced.

4,482,964

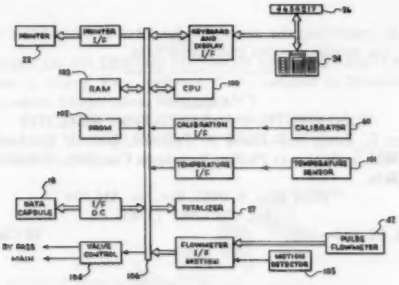
FLUID REGISTER SYSTEM

Patricio Berstein, Thornhill, and Walter R. Stephens, Islington, both of Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 283,102, Jul. 13, 1081, , and a continuation-in-part of Ser. No. 128,647, Mar. 10, 1980, Pat. No. 4,313,168. This application Jan. 23, 1984, Ser. No. 573,105

Int. Cl.[3] **G06F** *15/42;* **B67D** *5/00*

U.S. Cl. 364—465 **40 Claims**



1. A data network for accounting for a number of fluid commodity deliveries, comprising:

a portable two-way memory capsule;

a first data station for entering data and information into, and retrieving information and data from, said portable two-way memory capsule; and

a second data station for entering data and information into, and retrieving data and information from said portable two-way memory capsule, said second data station being operatively associated with a fluid commodity delivery means for dispensing plural deliveries of a fluid commodity.

4,482,965

TAXIMETER WITH TARIFF DISPLAY MODE CONTROLLED BY REMOVABLE MEMORY ADDRESSABLE BY FARE RATE KEYS

Iwao Tateishi, Yamatokoriyama; Takemi Mizuta, Osaka; Tatuo Yokoyama, Yamatokoriyama, and Nobuyasu Kakutani, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 2, 1980, Ser. No. 165,338

Claims priority, application Japan, Jul. 4, 1979, 54-85461; Jul. 5, 1979, 54-93116[U]; Aug. 30, 1979, 54-111219

Int. Cl.[3] **G07B** *13/00, 13/10*

U.S. Cl. 364—467 **5 Claims**

1. An electronic taximeter comprising:

a fare calculation device within the body of said taximeter;

a plurality of tariff keys for sending tariff information to said fare calculation device;

a tariff display including a plurality of tariff condition displaying elements;

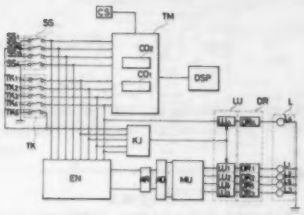
a memory device fitted removably to said body of taximeter and containing tariff display enabling and disabling information associated with said respective tariff displaying elements;

an address generator for generating an address signal corresponding to an actuated one of said plurality of tariff keys upon actuation thereof;

an address circuit for specifying the address of said memory device in response to said address signal produced by said address generator; and

means for enabling or disabling said tariff displaying elements according to said tariff condition enabling and disabling information recalled from a particular address area of said memory device as specified by said address signal;

said memory device producing an enabling and disabling signal when said address circuit specifies the address in said memory device corresponding thereto;



said means for enabling and disabling including bistable latch means for driving said tariff display elements corresponding to the information contained in said enabling and disabling signal;

wherein said tariff displaying conditions responsive to actuation of said tariff keys are optionally selectable by exchange of said memory device or changes in the contents of said memory device.

4,482,966

DETECTOR FOR CHROMATOGRAPHS

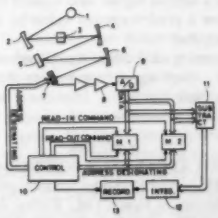
Yasuhiro Mito, and Hideo Iwasaki, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Feb. 10, 1982, Ser. No. 347,756

Claims priority, application Japan, Feb. 23, 1981, 56-25996

Int. Cl.[3] **G06G** *7/75*

U.S. Cl. 364—498 **7 Claims**



1. Apparatus for use in combination with a chromatograph column comprising:

means for detecting the degree of transmission of light through a chromatograph column for a plurality of selected wavelengths (j) and for generating signals in accordance with said detected transmission for said selected wavelengths;

computing means which computes a ratio with respect to at least one of said selected wavelengths, said ratio having as its numerator a value indicative of the signal generated by said detecting means for one of said selected wavelengths and having as its denominator a value corresponding to the square root of a summation of the algebraic squares of values indicative of the signals generated by said detecting means with respect to each of said selected wavelengths; and,

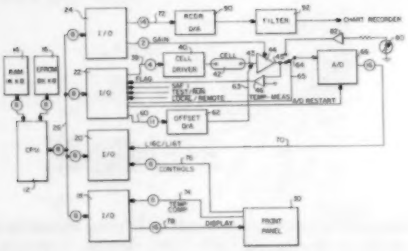
means connected said detecting means to said computing means.

4,482,967

CONDUCTIVITY DETECTOR AND METHOD

Barton Evans, Jr., Menlo Park, and James B. Stolz, Mountain View, both of Calif., assignors to Dionex Corporation, Sunnyvale, Calif.

Filed Sep. 18, 1981, Ser. No. 303,546
Int. Cl.³ G06F *15/42, 11/00*; G01N *27/46*
U.S. Cl. 364—499 **8 Claims**



1. An ionic conductivity detector comprising,

means for generating a first signal representing the ionic conductivity of a solution in a conductivity cell,

means for generating an offset signal which is applied to said first signal to generate a second signal, said second signal being maintained below a predetermined value by incrementing the offset signal, and

means for digitally processing said offset signal and said second signal to generate a third signal representing the measured value of said conductivity.

7. In an ionic conductivity detector the method comprising the steps of

generating a first signal representing the ionic conductivity of a solution in a conductivity cell,

generating an offset signal which is applied to said first signal to generate a second signal, said second signal being maintained below a predetermined value by incrementing the offset signal, and

digitally processing said offset signal and said second signal to generate a third signal representing the measured value of said conductivity.

4,482,968

METHOD AND APPARATUS FOR ROBOT CONTROL

Hajimu Inaba, Hino, and Shinsuke Sakakibara, Kunitachi, both of Japan, assignors to Fanuc Ltd., Tokyo, Japan

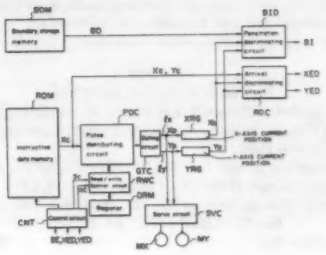
Filed Dec. 28, 1981, Ser. No. 334,928
Claims priority, application Japan, Dec. 30, 1980, 55-186745
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—513 **11 Claims**

1. A method of controlling a robot having predetermined forbidden areas of movement, wherein robot operations are stored as robot instruction data in a first memory and the robot is subsequently actuated in accordance with the stored robot instruction data, comprising the steps of:

(a) storing in a second memory predetermined information indicative of the predetermined forbidden areas which the robot is forbidden to enter;

(b) creating robot instruction data by moving the robot along a desired path to a target position during the storing of robot operations, without regard to said predetermined forbidden areas by storing in the first memory, robot instruction data representing the desired path;

(c) modifying the robot instruction data in accordance with said predetermined information indicative of the predetermined forbidden areas; and



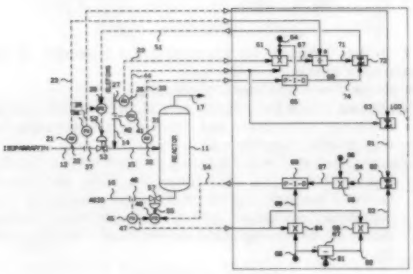
(d) controlling the motion of the robot in accordance with the modified robot instruction data.

4,482,969

CONTROL OF AN ALKYLATION REACTOR

Gary L. Funk, and James A. Feldman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 9, 1982, Ser. No. 356,594
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—500 **34 Claims**



1. Apparatus comprising:

a first alkylation reactor;

means for combining an isoparaffin-containing first fluid stream with an olefin-containing second fluid stream to form a combined feed stream and for providing said combined feed stream to said first alkylation reactor;

means for providing a third fluid stream containing an acid which is suitable for catalyzing an alkylation reaction to said first alkylation reactor;

means for establishing a first signal representative of the desired isoparaffin to olefin ratio in said combined feed stream;

means for establishing a second signal representative of the actual percentage of said second fluid stream which is olefins based on an analysis of the components of said second fluid stream which are not olefins;

means for establishing a third signal representative of the flow rate of said second fluid stream;

means for multiplying said first, second and third signals to establish a fourth signal which is representative of the flow rate of isoparaffin in said first fluid stream required to maintain the actual isoparaffin to olefin ratio in said combined feed stream substantially equal to the desired isoparaffin to olefin ratio represented by said first signal;

means for establishing a fifth signal representative of the actual percentage of said first fluid stream which is isopar-

affin based on an analysis of the components of said first fluid stream which are not isoparaffin;

means for dividing said fourth signal by said fifth signal to establish a sixth signal which is representative of the actual flow rate of said first fluid stream required to maintain the actual isoparaffin to olefin ratio in said combined feed stream substantially equal to the desired isoparaffin to olefin ratio represented by said first signal; and

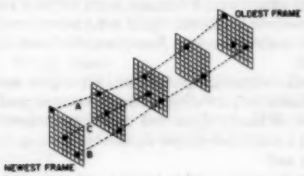
means for manipulating the flow rate of said first fluid stream in response to said sixth signal to thereby maintain the actual isoparaffin to olefin ratio in said combined feed stream substantially equal to the desired ratio represented by said first signal.

4,482,970

BOOLEAN FILTERING METHOD AND APPARATUS

Patrick E. Barry, Port Jefferson, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 6, 1981, Ser. No. 319,040
Int. Cl.³ H04N 7/12; G01S 13/00
U.S. Cl. 364—517 **7 Claims**



1. A method of filtering in real time space-time data consisting of a plurality of binary data frames each containing an equal number of points comprising the steps of:

(a) storing sequentially each of the plurality of binary data frames;

(b) recursively determining whether the points of a sequence of M, where M is an integer, of the plurality of stored binary data frames forms at least one continuous string by logically comparing each of the stored binary data frames comprising said sequence of M with the binary data frame which preceded it and the binary data frame which followed it on a point by point basis; and

(c) outputting the points of each of said compared binary data frames which when compared with the points in the other stored binary data frames comprising said sequence of M form a continuous string, said outputted points being filtered space-time data.

4,482,971

WORLD WIDE CURRENCY INSPECTION

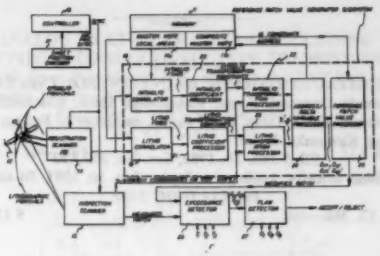
Henry Blazek, Brookfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 18, 1982, Ser. No. 340,138
Int. Cl.³ G06K 9/04
U.S. Cl. 364—552 **13 Claims**

1. An inspection apparatus for detecting flaws on test documents having multiple misregistered images, comprising in combination,

first means for optically scanning test documents,

second means generating in real time a reference document having the same misregistration between images as the test document being scanned,



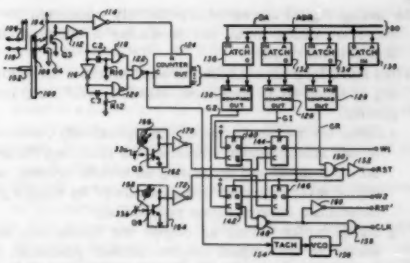
third means comparing said test document with said generated reference document for identifying a flawed test document.

4,482,972

DISTANCE SENSING APPARATUS AND METHOD

Clarence A. Lewis; James E. Lewis, and Richard D. Lewis, all of R.D. 3 Box 115, Blairstown, N.J. 07825

Filed Jun. 25, 1981, Ser. No. 277,224
Int. Cl.³ G01B 7/00, 7/24
U.S. Cl. 364—561 **19 Claims**



1. Apparatus for sensing the distance between a pair of indicia on a surface being transported by a transporter relative to said apparatus, comprising:

interval means positioned alongside said transporter for providing in response to motivation of said surface successive interval signals, the time elapsing between two successive interval signals corresponding to a predetermined length of movement of said surface, said surface being transported by said transporter at a relatively constant velocity during passage of said predetermined length of movement;

sensor means positioned alongside said surface for providing, in response to the successive arrival times of said pair of indicia at said sensor means, first and second pulses; and

timer means coupled to said interval means and sensor means to receive said inverval signals and said first and second pulses for producing first, second, and third discrete signals analogous to the time period GR required for passage of said predetermined length of movement of said surface, and the times of arrival W1 and W2 of said pair of indicia, respectively, said timer means including:

a clock means for periodically producing clock pulses; and

counting means for counting pulses from said clock means for determining the time duration of values GR, and W2−W1, said apparatus further including:

ratio means for calculating the ratio D=(W2−W1)/GR from said first through third digital signals, where D

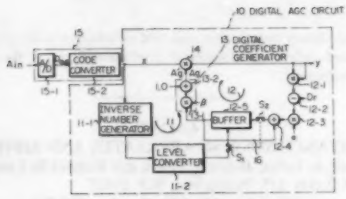
represents the distance between said pair of indicia in arbitrary units.

4,482,973

DIGITAL AUTOMATIC GAIN CONTROL CIRCUIT

Shigeyuki Unagami, Zama; Kuninosuke Ihira, Kawasaki, and Takashi Kaku, Tama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1982, Ser. No. 393,120
Claims priority, application Japan, Jun. 30, 1981, 56-100534
Int. Cl.³ H03G *3/20*
U.S. Cl. 364—602 **5 Claims**



1. A digital automatic gain control (AGC) circuit, comprising:

an analog/digital converter, operatively connected to receive an analog input, for producing a corresponding digital input signal;

a first AGC loop having a feedforward structure for producing an initial AGC coefficient, said first AGC loop comprising:

a digital inverse number generator, operatively connected to said analog/digital converter, for receiving the digital input signal and generating an inverse number, said digital inverse number being calculated by using a predetermined approximation polynomial;

a digital buffer having an output and operatively connected to said digital inverse number generator, for receiving, storing and providing said calculated digital inverse number;

a digital AGC coefficient generator, operatively connected to said digital buffer, for receiving said calculated digital inverse number and for generating an output; and

a digital multiplier, operatively connected to said digital AGC coefficient generator, for receiving said generated output and the digital input and outputting a digital AGC output;

a second AGC loop, activated sequentially with said first AGC loop, having a feedback structure for producing a real AGC coefficient, said second AGC loop comprising:

a digital square circuit, operatively connected to said digital multiplier, for receiving and full-wave rectifying said digital AGC output; and

an integrator circuit operatively connected to said digital square circuit, comprising:

a digital adder having an input operatively connected to said integrator circuit, an operatively connected to said digital buffer; and

a feedback path forming a closed loop between the output of said digital buffer and the input of said digital adder;

said digital AGC coefficient generator of said first AGC loop operatively connected to said digital buffer; and

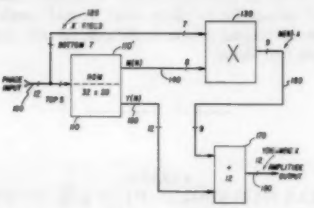
said digital multiplier, operatively connected to receive said output from said digital AGC coefficient generator and the digital input signal, for producing said digital ACG output.

4,482,974

APPARATUS AND METHOD OF PHASE-TO-AMPLITUDE CONVERSION IN A SINE FUNCTION GENERATOR

Albert W. Kovalick, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 13, 1982, Ser. No. 407,844
Int. Cl.³ G06J *1/00*
U.S. Cl. 364—607 **7 Claims**



1. A phase-to-amplitude converter comprising

an input port to receive an input binary signal representing phase;

a storage means coupled to said input port for providing an intermediate amplitude signal and a subintermediate slope signal in response to a first portion of said input binary signal;

a multiplier means coupled to said input port and said storage means for providing in response to a second portion of said input binary signal and to said subintermediate slope signal a multiplier output signal representing intermediate slope; and

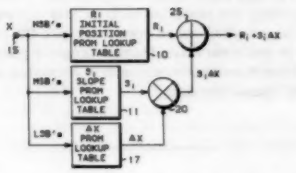
an adder means coupled to receive said multiplier intermediate slope signal and said intermediate amplitude signal for providing a converter output signal representing amplitude.

4,482,975

FUNCTION GENERATOR

Thomas M. King, Mesa; Cary R. Champlin, Chandler, and Sam M. Daniel, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 29, 1982, Ser. No. 362,740
Int. Cl.³ G06J *1/00*
U.S. Cl. 364—608 **6 Claims**



1. Apparatus for generating an output digital signal that approximates the value of a predetermined mathematical function lying in the X-Y plane at a point defined by an input digital signal comprising:

position storage means having stored therein a plurality of precalculated points, R_i, each lying on a different linear least-means-squares line segment approximating a different section of the mathematical function, said position stroage means having an input connected to receive at least a portion of the input digital signal, and an output, for providing an output signal at the output thereof representative of an appropriate one of the stored precalculated

points in response to the input of at least the portion of the input digital signal;

slope storage means having stored therein the plurality of precalculated slopes, S_i, each defining the slope of a different one of the line segments, said slope storage means having an input connected to receive at least a portion of the input digital signal, and an output, for providing an output signal at the output thereof representative of an appropriate one of the stored slopes in response to the input of at least the portion of the input digital signal;

means having an input connected to receive at least a portion of the input digital signal and an output, for determining the distance, ΔX, along the X axis, from the point R_i to the point defined by the input digital signal and providing at the output thereof an output signal representative of ΔX;

multiplication means connected to the outputs of said slope storage means and said distance determining mean for providing on an output thereof an output signal which is the product, $S_i\Delta X$, of the applied output signals, and

summing means connected to the outputs of said position storage means and said multiplication means for providing on an output thereof an output signal which is the sum, $R_i+S_i\Delta X$, of the output signal applied thereto and which is an approximation of the value of the mathematical function at the point defined by the input digital signal.

4,482,976

VOICE DATA OUTPUT APPARATUS FOR ELECTRONIC CASH REGISTERS

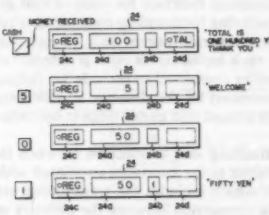
Hiroyuki Ishikawa, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 258,949, Apr. 30, 1981, abandoned. This application Oct. 26, 1983, Ser. No. 545,594

Claims priority, application Japan, May 8, 1980, 55-61138

Int. Cl.³ G06F *3/16*; G10L *1/00*

U.S. Cl. 364—710 **4 Claims**



1. A voice data output apparatus for an electronic cash register comprising:

input means having at least numerical keys for inputting numerical data and transaction keys, at least one of said transaction keys generating input signals designating the completion of a registering operation for one client;

control means coupled to said input means for performing predetermined operations according to said input signals from said transaction keys and for supplying numerical data input by the operation of said numerical keys;

visual information output means coupled to said control means for outputting visual information corresponding to said numerical data supplied from said control means;

means responsive to operation of said at least one transaction key for storing flag data for indicating whether or not the registration of sales data is completed for one client after the operation of said at least one transaction key; and

voice output means coupled to said control means for outputting a numerical voice signal according to said numerical data supplied from said control means and responsive to the stored flag data for outputting an audible greeting voice when said flag data indicates that said registration has been completed for one client and when one of said numerical keys is operated to input the first digit of a series of numerical data which is to be input by the operation of said numerical keys.

4,482,977

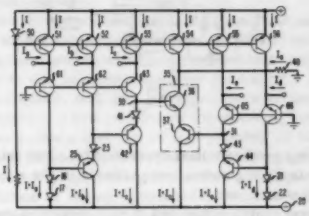
ANALOG MULTIPLIER CIRCUIT INCLUDING OPPOSITE CONDUCTIVITY TYPE TRANSISTORS

David G. Ross, Fair Haven, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 7, 1982, Ser. No. 337,706

Int. Cl.³ G06G *7/16*

U.S. Cl. 364—841 **11 Claims**



8. A current ratio circuit comprising

first means for generating a first voltage proportional to a sum of logarithms of the magnitudes of a group of currents;

second means for generating a second voltage proportional to a logarithm of the magnitude of a different current;

means connected with the first and second means and responsive to a difference between the first and second voltages for producing an output current directly proportional to a product of the currents of the group of currents and inversely proportional to the different current;

a group of current sources for supplying the group of currents to the first means;

a different current source for supplying the different current to the second means;

the first means including a first string of semiconductor junctions connected in series, each semiconductor junction conducting one of the group of currents, the first string of semiconductor junctions producing the first voltage thereacross; and

the second means including one or more semiconductor junctions connected in series for conducting the different current and producing the second voltage thereacross.

4,482,978

KEY SWITCH INPUT CONTROL CIRCUIT

Yoshio Yuasa, Kawachinagano; Kazuhiko Naruse, and Nobukazu Kawagoe, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 25, 1981, Ser. No. 296,144

Claims priority, application Japan, Aug. 29, 1980, 55-123291[U]

Int. Cl.³ G06F *3/02*

U.S. Cl. 364—900 **9 Claims**

1. An instrument comprising:

a plurality of manually operable input switches;

means connected to said input switches for generating a signal in response to manual operation of one of said switches;

a data storing means for storing data;

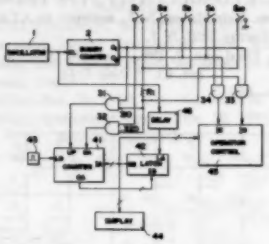
a data changing means connected to said data storing means for changing said data in response to said signal;

a gate means interposed between said means for generating and said data changing means for selectively passing said signal;

a control switch connected to said gate means and manually

operable for selectively blocking and unblocking said gate means such that said data stored in said data storing means can be changed with said gate means unblocked and cannot be changed with said gate means blocked;

an execution means connected to said data storing means for



executing predetermined operations based on said data in said data storing means irrespectively of the state of said control switch; and

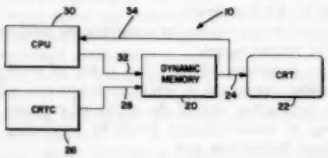
an initiation switch connected to said execution means and manually operable for initiating the operation of said execution means.

4,482,979

VIDEO COMPUTING SYSTEM WITH AUTOMATICALLY REFRESHED MEMORY

George A. May, R.R. 1, E. Sooke Rd., Sooke, British Columbia, Canada V0S 1 NO

Filed Feb. 4, 1982, Ser. No. 345,820
Int. Cl.³ G09G *1/16*
U.S. Cl. 364—900 **11 Claims**



1. A video computing system with automatically refreshed memory comprising:

dynamic memory means capable of storing information;

display means connected to said dynamic memory means and operating on a raster scanning format;

controller means, operatively connected to said dynamic memory means, for sequentially generating addresses corresponding to locations in said memory means and for reading the information at such locations; and

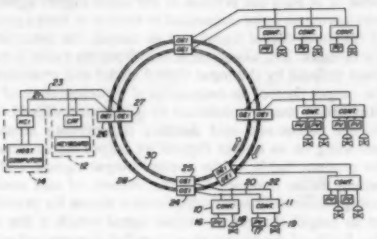
central processing means operatively connected to said dynamic memory means, said central processing means operating on an alternating fetch and execute cycle wherein the controller means and the central processing means are substantially synchronized to operate in sequential fetch and execute cycles and wherein during each fetch phase the central processing means has access to the information in said dynamic memory means during each fetch phase but not during each execute phase, such that during said execute phase, the controller means has direct access to said memory means enabling information stored in the dynamic memory means to be supplied to the display means and wherein the sequential and continuous reading of the memory means during each execute phase functions to continuously refresh the dynamic memory means.

4,482,980

HYBRID OPTICAL/ELECTRICAL DATA HIGHWAY

Simon Korowitz, Hatfield, and Francis E. McMenamin, Chalfont, both of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed May 3, 1982, Ser. No. 373,918
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **2 Claims**



1. A communications system for a large number of widely spaced control stations a different selected one of which may be operating as a transmitting station at different times, comprising:

local data transmission networks having two metal wired interconnections providing redundant multi-drop communication channels between all of the control stations of a group determined by geographical location;

a global data highway having two optical communication channels each forming a ring for providing redundant signal transmission completely around said rings in opposite directions between the transmission networks of said groups;

an optical-electrical interface for each of said groups interposed in each ring for coupling each metal wired interconnection to a separate one of said optical channels, said interfaces each including an optical detector and an optical transmitter connected to provide for retransmission of the data received by the detector so that data will flow completely around said global rings in opposite directions; and

means for disabling said connection between the detector and transmitter at the interfaces associated with the group of stations which includes the transmitting station while making the connection between the network of the transmitting station and the detector and transmitter of its interface for receipt at said transmitting station of any transmission sent by the transmitting station after the transmission has passed through the optical rings to thereby provide a check on the continuity of said rings.

4,482,981

INPUT DEVICE FOR POCKET ELECTRONIC TRANSLATOR

Masafumi Morimoto, Yamatokoriyama; Shigenobu Yanagiuchi, Tenri, and Noboru Akizuki, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1982, Ser. No. 445,512
Claims priority, application Japan, Dec. 2, 1981, 56-194788
Int. Cl.³ G06F *15/38*
U.S. Cl. 364—900 **9 Claims**

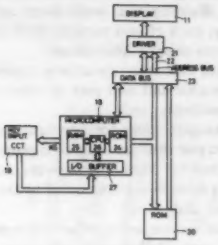
1. An input device for inputting a first word represented in a first language, the input device being adapted for an electronic translator for obtaining a second word represented in a second language, equivalent to the first word, in response to the input of the first word, comprising:

first specifying means for specifying one of alphabets to define a first alphabet;

second specifying means for specifying one of the alphabets to define a second alphabet;

input means for controlling the first and the second specifying means to input said first and second alphebets into the electronic translator;

memory means for memorizing a plurality of full words;



access means provided for addressing the memory means to retrieve words starting with the first and second alphabets; and

display means responsive to the access means for displaying the words.

4,482,982

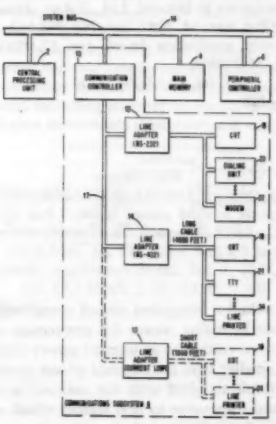
COMMUNICATION MULTIPLEXER SHARING A FREE RUNNING TIMER AMONG MULTIPLE COMMUNICATION LINES

Kin C. Yu, Burlington, and Gary J. Goss, Acton, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 191,626, Sep. 29, 1980,. This application Jul. 18, 1983, Ser. No. 514,542

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—900 **8 Claims**



1. A data processing system includes a central processor unit, a main memory and a communication controller, all coupled in common to a system bus, a plurality of communication channels, each coupled to said communication controller, said communication controller transferring data bytes between said main memory and said plurality of communication channels and generating a plurality of timeout conditions for each of said plurality of communication channels, said communication controller comprising:

free running timer means for generating a sequence of timing signals representative of consecutive binary numbers;

line microprocessor means coupled to said plurality of communication channels and having means for generating one of a plurality of binary count signals indicative of a time delay for a predetermined communication channel and channel number signals specifying said predetermined communication channel after which said line microprocessor means will initiate a predetermined event, said line microprocessor means further having means for generating an interrupt signal for indicating that said line microprocessor means has loaded a shared memory means with said one of said plurality of binary count signals;

said shared memory means coupled to said line microprocessor means and including first means for storing said one of said plurality of binary count signals and said channel number signals;

I/O microprocessor means coupled to said line microprocessor means, said shared memory means and said free running timer means, and having control store means responsive to said interrupt signal for generating a plurality of microwords, said I/O microprocessor means being responsive to a first microword for receiving from said first storing means said one of said plurality of binary count signals indicative of a first binary number, said I/O microprocessor means having means for receiving a first of said sequence of timing signals indicative of a second binary number in response to a second microword, and having means for adding said first and said second binary numbers and generating signals representative of a resulting third binary number in response to a third microword, said I/O microprocessor means further having means for comparing said third binary number and a subsequent second binary number and generating first signals indicative of said third binary number being equal to or less than said subsequent second binary number in response to a fourth microword;

said line microprocessor means being responsive to said first signals for generating a predetermined sequence of operations in accordance with one of said plurality of timeout conditions for said predetermined channel.

4,482,983

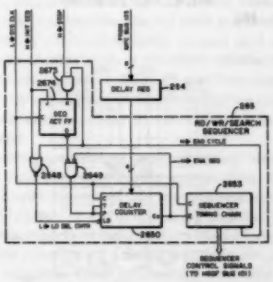
VARIABLE SPEED CYCLE TIME FOR SYNCHRONOUS MACHINES

Leo J. Slechta, Jr., Rosemount, Minn., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 161,987, Jun. 23, 1980,. This application Oct. 13, 1983, Ser. No. 541,488

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—900 **4 Claims**



1. A timing chain signal generating apparatus responsive to reference clock pulses for, in a cyclically continuous manner, firstly not generating timing chain signals during a DELAY TIME interval of variable time duration and then, secondly, generating a plurality of timing chain signals during a SEQUENCE TIME interval of fixed time duration, said apparatus for not generating timing chain signals for an interval of

variable time duration and for then generating timing chain signals for an interval of fixed time duration comprising:

counter means responsive to received said reference clock pulses for counting from a number quantity to a predetermined value;

loading means coupled to said counter means for loading said counter means with a number quantity corresponding to a desired said DELAY TIME interval;

sequencer timing chain means receiving said reference clock pulses for generating responsively thereto while enabled a plurality of timing chain signals;

clock means for providing said reference clock pulses; and

control means coupled to said counter means and said sequencer timing chain means for, in continuous cyclical sequence,

firstly causing that said counter means is loaded with said number quantity by said loading means, and then

secondly, upon said counter means having counted from said number quantity to a predetermined value, causing that said sequencer timing chain means is enabled for generating said timing chain signals, and then

thirdly, after said generating said timing chain signals has transpired for a fixed number, said plurality, of said timing chain signals, which SEQUENCE TIME interval is thus of fixed time duration, causing that said counter means is reloaded with said number quantity by said loading means;

whereby said sequencer timing chain means is not enabled for generating said timing chain signals until said counter means has counted, responsively to said reference clock pulses, from said number quantity which was loaded within said counter means to a predetermined value, thus said sequencer timing chain means is not enabled for generating said timing chain signals until an interval of variable time duration, which variable time duration is dependent upon said number quantity, has transpired;

whereby said sequencer timing chain is enabled for generating said timing chain signals until said fixed number, said plurality, of said timing chain signals have been generated, which, because said timing chain signals are generated responsively to said reference clock pulses, means that said sequencer timing chain is enabled for generating said timing chain signals for a fixed number of said reference clock pulses, ergo for an interval of fixed time duration.

4,482,984

STATIC TYPE SEMICONDUCTOR MEMORY DEVICE

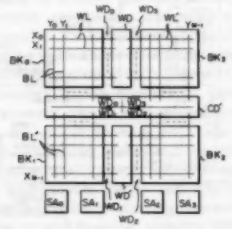
Atsushi Oritani, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 7, 1981, Ser. No. 309,437

Claims priority, application Japan, Oct. 9, 1980, 55-141655

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—154 **15 Claims**



1. A static type semiconductor memory device, comprising:

a cell array having a plurality of memory cells disposed at cross points of a plurality of word lines and a plurality of bit lines, and in which memory device the access to a selected memory cell is effected by selecting a word line connected to the selected memory cell and by selecting a bit line connected to the selected memory cell according to input address signals, said cell array comprising a plurality of cell array blocks which are formed by dividing said cell array in a direction parallel to said word lines and in a direction parallel to said bit lines and each cell array block comprising divided word lines and divided bit lines formed by dividing said word lines and said bit lines, respectively, each of said memory cells comprising:

a pair of cross coupled transistors;

a pair of load elements operatively connected between a voltage source and said pair of cross coupled transistors, respectively; and

a pair of transfer transistors operatively connected between said pair of cross coupled transistors and a pair of said divided bit lines, respectively, and having gate electrodes operatively connected to one of said divided word lines; and

a word decoder section and a column decoder section, both operatively connected to said cell array, which, respectively, select only a divided word line and a divided bit line of said cell array block containing the selected memory cell according to said input address signal.

4,482,985

SEMICONDUCTOR INTEGRATED CIRCUIT

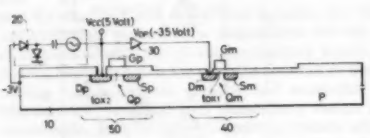
Kiyoo Itoh, Higashikurume, and Ryoichi Hori, Nishitama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,162

Claims priority, application Japan, Apr. 17, 1981, 56-57143; Oct. 23, 1981, 56-168698

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—226 **23 Claims**



1. A semiconductor integrated circuit comprising:

a first circuit including means for converting an external power source voltage to an internal power source voltage which is smaller than the external power source voltage;

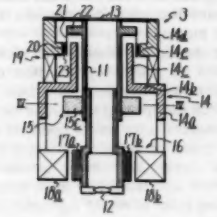
a second circuit supplied with the external power source voltage and responsive to first signals which regulate an operation of the integrated circuit, said second circuit including means for generating second signals which control the integrated circuit so that the integrated circuit performs the regulated operation, the second circuit comprising, as a part thereof, first transistors supplied with the external power source voltage and responsive to the first signals, wherein the second signals have amplitudes smaller than those of the first signals; and

a third circuit supplied with the internal power source voltage and responsive to the second signals for performing the regulated operation, said third circuit comprising, as a part thereof, second transistors which are supplied with the internal power source voltage and which have a smaller size than that of the first transistors.

4,482,986
OBJECTIVE LENS MOUNT FOR OPTICAL DISC PLAYER

Toyokazu Noda, Tokyo, and Hiroshi Ohki, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,007
Claims priority, application Japan, Jan. 30, 1981, 56-12563; Jun. 22, 1981, 56-91969[U]
Int. Cl.³ G11B 7/12
U.S. Cl. 369—44 15 Claims

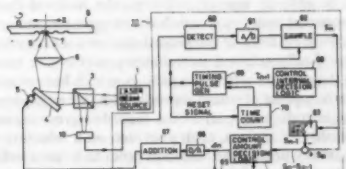


1. A playback apparatus that directs a light beam against a record medium surface for optically reading information recorded in a track on such surface comprising; an objective lens assembly including lens means interposed in the path of said light beam for focusing the latter substantially at said record medium surface, a tubular lens mounting member through which said path extends longitudinally and having said lens means mounted at one end of said mounting member with an optical axis of said lens means coinciding substantially with said path of the light beam therethrough, a support member extending about said mounting member, metallic leaf spring means extending between the other end of said tubular mounting member and said support member for longitudinal movements of said mounting member in the direction of said optical axis and for swinging movements of said mounting member about a center in said other end, and a substantially bulky elastic body of foamed synthetic resin interposed between said support member and said tubular mounting member at a location along the latter spaced from said other end for further supporting said mounting member in respect to said longitudinal and swinging movements relative to said support member.

4,482,987
OPTICAL INFORMATION REPRODUCING APPARATUS

Kazuo Okada, and Fumiaki Imado, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,601
Claims priority, application Japan, Jul. 7, 1981, 56-106640
Int. Cl.³ H04N 5/76; G11B 21/00
U.S. Cl. 369—44 13 Claims



1. An optical information reproducing apparatus, comprising:

an optical system adapted for shifting a position of a light spot in a direction to impinge upon a surface of a recording medium having a track having information recorded thereon in a form readable by means of optical means and for condensing a reflection of said light spot for causing the same to impinge upon a photodetector,

means for sampling at predetermined intervals an output signal of said photodetector for reading a value of an envelope signal thereof in the form of a succession of envelope values,

means for comparing successively read envelope values for providing a difference signal representing a difference therebetween,

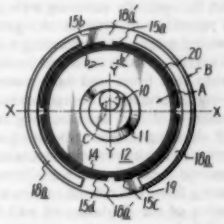
means responsive to the sign of said difference signal for providing a correcting signal for reversing the direction of shift of the position of said light spot, and

light spot position adjusting means responsive to said correcting signal for adjusting the position of said light spot.

4,482,988
OBJECTIVE LENS MOUNT AND DRIVE FOR OPTICAL DISC PLAYER

Katsuaki Tsurushima, Kawasaki, and Kenji Shintani, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 336,551, Jan. 4, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 579,800
Claims priority, application Japan, Jan. 16, 1981, 56-5783
Int. Cl.³ G11B 7/08, 7/12
U.S. Cl. 369—45 8 Claims



1. In an apparatus directing a light beam against a record medium surface for optically reading information recorded in a track on such surface; the combination of

a movable member including lens means interposed in the path of said light beam and having a central axis parallel with the direction of the passage of the light beam therethrough, lens support means extending outwardly from said lens means, first and second coil means attached to said lens support means, said first coil means including substantially rectangular-shaped coils and said second coil means being circumferentially wound and having said rectangular-shaped coils in stratified relation thereto, and a first bearing member fixed to said lens support means with a longitudinal axis of said first bearing member being offset laterally in respect to said central axis of said lens means; and

a fixed member including a second bearing member engaging said first bearing member and guiding the latter for angular displacements of said movable member about said longitudinal axis of the first bearing member and for slidable displacements in the direction of said longitudinal axis and means constituting a single magnetic circuit for generating a magnetic field intersecting said first coil means except at one side of each of said rectangular-shaped coils so that said angular displacements of the movable member are affected in response to supplying of a first driving current to said first coil means, said magnetic field also intersecting said second coil means so that said slidable displacements of the movable member are effected in response to supplying of a second driving current to said second coil means.

4,482,989

APPARATUS FOR OPTICALLY SCANNING A DISC-SHAPED RECORD CARRIER

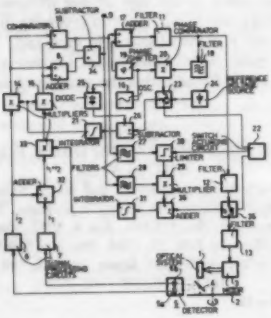
Martinus P. M. Bierhoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,450

Claims priority, application Netherlands, Nov. 26, 1981, 8105346

Int. Cl.[3] **G11B** *7/00, 27/00*

U.S. Cl. 369—46 **13 Claims**



1. An apparatus for optically scanning a record carrier having information recorded thereon in elongated tracks, said apparatus comprising means for projecting a radiation beam onto said record carrier so as to scan said tracks upon relative movement between said beam and said record carrier, first means for deriving information contained in a track being scanned from radiation of said beam coming from the record carrier, said first deriving means producing an information signal representative of the information contained in said track being scanned, second means for deriving from said radiation of said beam coming from the record carrier a tracking error signal representative of the deviation of said beam from the center of the track being scanned in a direction transverse to the track direction, and means responsive to said tracking error signal for moving said beam in said transverse direction so as to maintain said beam centered on said track being scanned, said second deriving means comprising a tracking control loop including at least two adjacent detectors disposed in the path of said said radiation coming from said record carrier and each supplying an output signal, means for comparing said output signal supplied by said detectors and generating said tracking error signal, variable amplifier means arranged in said control loop for controlling the loop gain, means for applying a measuring signal of predetermined frequency to said control loop, means for detecting the response of said control loop to said measuring signal and means for controlling said variable amplifier means in dependence on the response of said loop detected by said detecting means so as to maintain the loop gain at a substantially constant value.

4,482,990

SIMPLIFIED SOUND-REPRODUCING DEVICE FOR A RECORD DISC HAVING A PLURALITY OF RECORDED GROOVES

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,597

Claims priority, application Japan, Aug. 31, 1983, 58-159987

Int. Cl.[3] **G11B** *17/00, 3/00*; **A63H** *3/33*

U.S. Cl. 369—63 **3 Claims**

1. A simplified sound-reproducing device comprising:

a casing;

a motor housed within the casing and connectable to a source of electric current;

a record disc unit pivotally received in the casing and rotated by the motor, the record disc unit having a record faced with a plurality of recorded grooves, each with a starting and an end point of sound reproduction;

means for resiliently supporting the record disc unit;

a speaker unit swingably mounted in the casing above the record face of the record disc for movement to and away from the record face, the speaker unit including a speaker cone and a sound transmitting member;

stylus force means for urging the sound transmitting member toward the record face of the record disc;

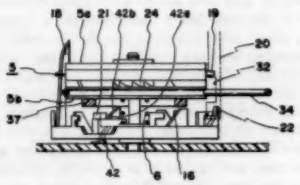
a pickup interposed between the sound transmitting member and the record disc unit and imparted a stylus force by the stylus force means;

return spring means for biasing the pickup towards the starting point of sound reproduction on the recorded grooves and away from the record face;

an ending switch for opening the circuit between the source of electric current in the motor upon arrival of the pickup at the end point of sound reproduction on a recorded groove and closing the circuit between the source of electric current and the motor upon return of the pickup to the starting point of sound reproduction on a recorded groove;

a stylus force releasing wheel pivotally received in the casing, the stylus force releasing wheel being co-axial with the record disc unit and normally rotatable in one direction;

a plurality of inclined faces formed on the stylus force releasing wheel, the number of inclined faces being the same as the number of recorded grooves on the record disc unit;



a stylus force releasing post means formed on the stylus force releasing wheel for lifting up the record disc unit and releasing the stylus force by rotation of the stylus force releasing wheel and allowing the pickup to return to the starting point of sound reproduction by the urging of the return spring means;

a stopper pin projecting outward beyond the rotational rim of the record disc unit;

a plurality of selection poles provided a number corresponding to the number of recorded grooves on the record disc unit, each of which is disposed in a position to confront the inclined face of the stylus force releasing wheel so as to be able to engage and urge the inclined face, when depressed and also to catch the stopper pin and temporarily stop rotation of the record disc unit thereby locate the specifically selected introductory part of the record disc to the position where the pickup, which has returned to its starting point of sound reproduction, for engagement with the introductory part of the recorded grooves; and

a plurality of springs, each provided on a selection pole for normally urging the selection poles to a retracted position outward from the casing; and wherein:

the stylus force releasing wheel includes a plurality of locking arms, each confronting a respective inclined face at a position backward of each selection pole, when each selection pole is in a depressed position, for urging said inclined face;

a jaw formed on each selection pole for catching and locking the locking arm of each selection pole to prevent it from retraction of the casing;

locking means for locking the stylus force releasing wheel at the position where the wheel has rotated against the urging of the spring means, the locking means comprising a hook for locking the stylus force releasing wheel at the position to which the stylus force releasing wheel is rotated against the urging of the spring means and an inclined face which acts to release the stylus force releasing wheel from its locked position;

the record disc unit comprises a turn table member and a record face member provided with a stopper pin, the turn table member and a record face member being arranged in a stacked, separated arrangement;

ratchet means interposed between the turn table and the record face member for enabling the turn table member alone to rotate and to enable the turn table member to be pushed and removed by the ratchet by tooth bight of the ratchet in an axial direction of the record face member temporarily locked by the engagement of the stopper pin with one of the selection poles; and

whereby the removing action of the turn table member pushes the hook and disengages the stylus force releasing wheel from the hook to allow the stylus force releasing wheel to return to the direction of urging of the spring means.

4,482,991

DISK RECORDING AND REPRODUCING DEVICE

Ichiro Kawamura, Osaka; Izumi Hino, Kyoto, and Makoto Fujita, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 11, 1982, Ser. No. 387,494

Claims priority, application Japan, Jun. 15, 1981, 56-91856

Int. Cl.³ G11B *3/58*

U.S. Cl. 369—77.2 **8 Claims**

1. In a disk recording and reproducing device of the type having a disk insertion opening, wherein in response to the operation of inserting a case housing a disk through said disk insertion opening into said device, disk clamping means clamps a region adjacent the outer edge of said disk, and when said case is withdrawn from said device through said disk insertion opening, said disk is withdrawn out of said case,

the improvement wherein said disk clamping means comprises:

a first finger having a leading edge and extending in a direction of movement of said case through said disk insertion opening, the leading edge of said first finger having a first clamping member adapted to engage one major surface of a disk adjacent the periphery thereof;

a second finger having a leading edge and extending in said direction, the leading edge of said second finger having a second clamping member adjacent said first clamping member and adapted to coact with said first clamping member so as to forcibly hold said disk therebetween, the other end of said second finger being movable in said direction of movement of said case through said disk insertion opening, said second clamping member being connected to a stationary member in such a way that said second clamping member can rotatably and longitudinally move toward and away from said first clamping member;

an arm having one end rotatably pivoted to said stationary member, so that when said second finger is caused to move in the direction in which said case is withdrawn, said second clamping member moves toward said first clamping member, the other end of said arm being rotatably coupled to said second finger;

a leaf spring means for biasing said arm so that said second clamping member approaches said first clamping member;

separation means for separating said first clamping member from said second clamping member when said separation means is released and

releasing means responsive to the initial insertion of said case through said disk insertion opening for releasing said separation means.

4,482,992

SKIP/ARM SERVO SYSTEM FOR A VIDEO DISC PLAYER

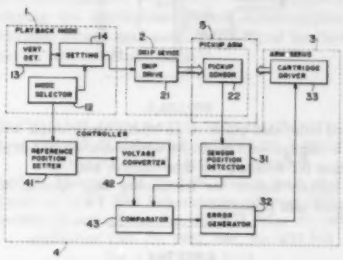
Keizo Shimizu; Katunobu Takeda; Tokinori Furuichi; Masao Oguri, all of Yokohama, and Junichi Ikoma, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 361,541

Claims priority, application Japan, Mar. 25, 1981, 56-42397

Int. Cl.³ H04N *5/76*; G11B *21/00*

U.S. Cl. 369—221 **8 Claims**



1. A skip/arm servo system for a video disc player wherein a signal sensing element scans a video disc having concentric recording tracks or recording tracks in the form of a spiral recording track recorded with information to at least one of detect, process and reproduce the recorded information therefrom, said system comprising:

means for generating a skip control signal;

skipping means responsive to the skip control signal for skipping said signal sensing element in a direction crossing the recording track to shift said sensing element from one recording track to another recording track;

means for detecting the relative position of said signal sensing element to a cartridge mounting said signal sensing element and for providing an output indicative thereof;

means for setting a predetermined reference relative position of said sensing element to said cartridge and for providing an output indicative thereof;

comparator means for comparing the output indicative of the detected relative position with the output indicative of the predetermined reference position for producing an error output when the detected and reference relative position outputs are different;

means for moving the cartridge in response to the error output from said comparator means so as to constantly maintain said signal sensing element in the reference relative position of said sensing element to said cartridge; and

said means for generating the skip control signal generating the skip control signal in accordance with a selected reproduction mode of the video disc player and said means for setting the predetermined reference relative position setting the predetermined reference relative position in accordance with the selected reproduction mode.

4,482,993

MOVING DRIVE SPINDLE FOR SLOT-TYPE PLAYER APPARATUS

Louis P. Agostini, Sint-Pieters-Leeuw, Belgium, assignor to Staar S. A., Belgium

Filed Apr. 18, 1983, Ser. No. 485,848

Claims priority, application Belgium, Apr. 29, 1982, 893.023

Int. Cl.³ G11B *1/00, 25/04*

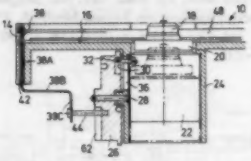
U.S. Cl. 369—263 **9 Claims**

1. In a disc record apparatus hving a fixed housing including an entrance slot for a disc record and a surface to slidably receive a disc record inserted edge first in its own plane through said slot to a playing position:

a drive spindle for a disc record;

a spindle housing including a drive motor for said drive spindle;

means for mounting said spindle housing on said fixed housing for translation axially of said spindle and perpendicularly relative to said plane from an insertion position displaced from said plane to an operative position with said hub in engagement centrally with a disc record in playing position for rotating the disc record; and



motor driven means for translating said spindle housing between said positions.

4,482,994

OPTICAL MULTIPLEXER/DEMULTIPLEXER USING INTERFERENCE FILTERS

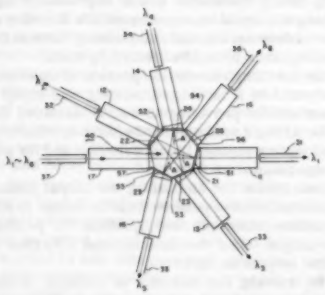
Shigeta Ishikawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,474

Claims priority, application Japan, Jun. 12, 1981, 56-90253

Int. Cl.³ H04B 9/00

U.S. Cl. 370—3 **13 Claims**



1. An optical multiplexer/demultiplexer for use in a wavelength division multiplexing system, which comprises optical energy transmission body means having N side faces, N being equal to or larger than three; first means associated with a first predetermined one of said N side faces for directing a single beam of radiant energy at a predetermined angle with respect to said predetermined one side face, said single beam being directed into or out of said body for a demultiplexing or multiplexing operation, said single beam containing M preselected wavelengths, M being equal to or smaller than N−1; a plurality of second means associated in a one-to-one correspondence with (M−1) side faces of said N side faces, each of said plurality of second means passing a beam containing a corresponding one of said M wavelengths and reflecting a beam containing at least one wavelength of said M wavelengths, other than said corresponding wavelength; third means associated with a second predetermined one of said N side faces for passing a beam finally reflected by said plurality of second means; and a plurality of fourth means associated in a one-to-one correspondence with said plurality of second means and with said third means, each of said plurality of fourth means receiving or transmitting a corresponding one of the beam passing through said second and third means for the demultiplexing or multiplexing operation.

4,482,995

TIME DIVISION MULTIPLEX SWITCHING NETWORK UNIT

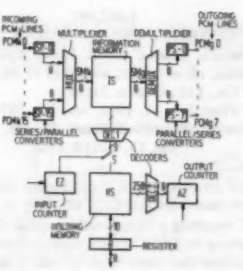
Reiner Binz, Hohenschaeftlarn; Eberhard Knorpp, Gauting, and Frithjof von Sichart, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 4, 1982, Ser. No. 345,596

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109767

Int. Cl.³ H04J 3/00

U.S. Cl. 370—59 **5 Claims**



1. A time division multiplex switching network unit for the connection of a plurality of pulse code modulation lines which produces a time-wise assignment and a spatial assignment of time channels used on incoming pulse code modulation lines by the cyclic storage of information and by correspondingly delayed reading of outgoing pulse code modulation words, comprising: a plurality of identical switching network modules each comprising

an information memory including storage cells, for receiving, storing and emitting pulse code modulated words,

a plurality of inputs for connection to the incoming pulse code modulation lines, each of said inputs connected to the corresponding inputs of each other module,

input means, including series/parallel conversion means connected to said incoming pulse code modulation lines and multiplexing means connected between said series/parallel conversion means and said information memory,

a plurality of outputs for connection to the outgoing pulse code modulation lines,

output means, including demultiplexing means connected to said information memory and parallel/series conversion means connected between said demultiplexing means and said plurality of outputs, and

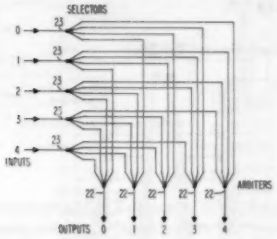
control means connected to said information memory for controlling cyclic storage and random access reading of pulse code modulated words and operable during each pulse frame to control the storage of a first predetermined number of pulse code modulated words which is a multiple of a second predetermined number of pulse code modulated words which can be read during a pulse frame.

4,482,996

FIVE PORT MODULE AS A NODE IN AN ASYNCHRONOUS SPEED INDEPENDENT NETWORK OF CONCURRENT PROCESSORS

Jesse R. Wilson, Austin, and Gary L. Logsdon, Round Rock, both of Tex., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 2, 1982, Ser. No. 414,071
Int. Cl.³ H04J 6/00
U.S. Cl. 370—60 **8 Claims**



1. A multiport module forming a node in an asynchronous digital communication network, said module having a number of ports which number is greater than two, said module comprising;

each port having an input means and

an output means; and

connection means for coupling each of said input means to each of said output means except for the output means of the port of the corresponding input means;

each of said input means including selection circuit means adapted to receive said data signals preceded by routing bit signals specifying which of said output means is to be selected for subsequent transmission and to signal the selected output means;

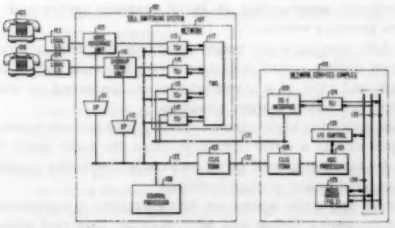
each of said selection circuit means includes means to make a selection by utilizing together, the first set of bits of the routing signal received, said first set of bits corresponding to that number of bits necessary to specify any one of said number of output means, which number of bits is greater than one.

4,482,997

ARRANGEMENT FOR REDUCING CLIPPING IN A DIGITAL CONFERENCE ARRANGEMENT

John H. Bobsin, Seoul, Rep. of Korea, and Mohamed A. Marouf, Lisle, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 27, 1982, Ser. No. 382,762
Int. Cl.³ H04M 3/56
U.S. Cl. 370—62 **5 Claims**



1. For use in a time division multiplexed conference arrangement having a plurality of channels wherein input audio samples are received in a first time frame and included in an output sample to be distributed to the channels during a time interval subsequent to said first time frame, an arrangement for assuring that an input sample from a designated channel is included in said output sample comprising:

detector means responsive to said input samples for generating a control signal designating each channel having an input sample above a predetermined threshold,

switching means responsive to said control signal for including in said output sample any input sample received from a designated channel, and

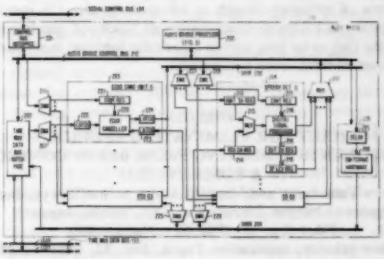
delay means operative independent of said control signal for delaying the application of said input samples to said switching means until said control signal has been generated by said detector means.

4,482,998

METHOD AND APPARATUS FOR IMPROVING THE QUALITY OF COMMUNICATION IN A DIGITAL CONFERENCE ARRANGEMENT

Mohamed A. Marouf, and Paul W. Vancil, both of Lisle, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 382,672, May 27, 1982,. This application Oct. 29, 1982, Ser. No. 437,545
Int. Cl.³ H04M 3/56
U.S. Cl. 370—62 **14 Claims**



1. In a multiport digital conference arrangement adapted to include information samples from selected ports in an output sample, each port being adapted to assume one of a plurality of states including a holdover state, a method for controlling state transitions of a selected port; comprising the steps of:

measuring the time interval information samples representing the level of a signal above a predetermined reference level are present on a selected port; and

causing the selected port to assume said holdover state when said measured time interval for the selected port is greater than a predetermined time interval.

4,482,999

METHOD OF TRANSMITTING INFORMATION BETWEEN STATIONS ATTACHED TO A UNIDIRECTIONAL TRANSMISSION RING

Philippe A. Janson, Wadenswil; Hans R. Mueller, Langnau, both of Switzerland, and Daniel T. W. Sze, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

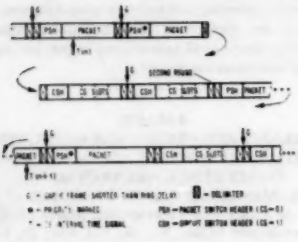
Filed Dec. 1, 1981, Ser. No. 326,291
Claims priority, application European Pat. Off., Dec. 8, 1980, 80107706.6
Int. Cl.³ H04J 6/00
U.S. Cl. 370—86 **11 Claims**

1. Method of transmitting information between stations attached to a unidirectional transmission ring, access to the ring for sending addressed information being given to stations, without frame synchronization, by a circulating frame header and a token indication, characterized in that for allowing both

non-periodic transmission of asynchronously furnished data packets as well as periodic transmission of synchronously furnished data blocks:

a particularly marked frame header for circuit-switched transmission is released as CS frame header by a CS monitor station in periodic intervals,

a CS frame header and a free token indication enable only previously authorized stations to send a block of synchronous data,



a non-marked frame header with a free token indication, enabling any station to transmit directly over the said unidirectional transmission ring a packet of asynchronous data of arbitrary length is released by the CS monitor station as PS frame header after all blocks of synchronous data due to be sent within a periodic interval from authorized stations were transmitted.

4,483,000

CIRCUIT FOR ELIMINATING SPURIOUS COMPONENTS RESULTING FROM BURST CONTROL IN A TDMA SYSTEM

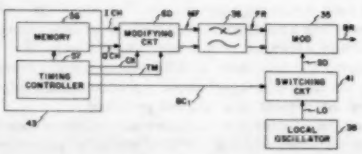
Kazuhiro Yamamoto, and Masaaki Atobe, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,598

Claims priority, application Japan, Jan. 12, 1981, 56-3671; Jan. 12, 1981, 56-3672

Int. Cl.³ H04J *3/16*

U.S. Cl. 370—95 **8 Claims**



1. An electronic circuit for use in a time division multiple access system and responsive to a sequence of baseband data signals and a burst control pulse for producing a data burst in a radio frequency band during presence of said burst control pulse, said data burst carrying said data signal sequence, said burst control pulse including a first spurious component, said circuit comprising a linear modulator responsive to a first signal in the baseband and a second signal in the radio frequency band for linearly modulating said second signal by said first signal to produce, as said data burst, a modulated signal, filter means responsive to a third signal in the baseband which includes said data signal sequence and a second spurious component for filtering said third signal to derive said first signal exempted from said second spurious component, generating means for generating a local oscillation signal in the radio frequency band, and signal supply means for supplying said modulator with said local oscillation signal as said second signal, said circuit further comprising:

switching means responsive to said data signal sequence and said burst control pulse for switching said data signal sequence in accordance with said burst control pulse to supply said filter means with said third signal.

4,483,001

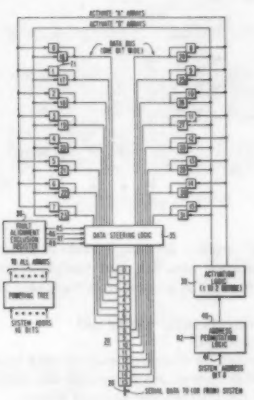
ONLINE REALIGNMENT OF MEMORY FAULTS

Philip M. Ryan, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,831

Int. Cl.³ G06F *11/10*; G11C *29/00*

U.S. Cl. 371—11 **8 Claims**



1. A memory system comprising in combination:

having a number of memory chips arranged in a matrix of N rows and M columns, each said chip having K×L individually addressable data bit positions;

K×L×N memory addresses, each of which comprises M bit positions;

a buffer for storing words each comprising M bit positions:

means for connecting the write input and the read output of each of said chip in each said column of said memory matrix to one of the buffer storage positions associated with each one of said memory columns;

a source of changeable control signals, and

data steering logic means connected to said source and said buffer for changing the connective relationship of said buffer storage positions associated with each bit position of said buffer relative to the position of said chips in the corresponding memory matrix column in response to said control signals, said control signals causing said relationship of said chips to said N buffer positions to be altered when said control signals are changed;

said source producing first and second control signals respectively representing an initial premute vector and a new permute vector,

said data steering logic means receiving said first control signal during a read operation when the read output of each said chip at a given address is connected to said associated buffer storage positions,

said data steering logic means receiving said second control signal during a write operation when the write input of each said chip at said given address is connected to said associated buffer storage positions;

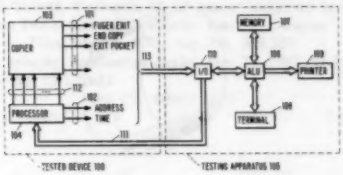
said read and write operations being successive operations and occurring before any address other than said given address is accessed,

whereby the same data bits read out of said given address of chips is written back into said given address of chips in permuted form.

4,483,002
DIGITAL DEVICE TESTING APPARATUS AND METHOD

Jay L. Groom, Jr., Longmont; Patricia J. Smith, and Gary G. Vair, both of Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,782
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—29 **2 Claims**



1. A method for testing a device by monitoring a plurality of device signals and displaying only those portions of the signals occurring between specified sets of signal values, comprising the steps of:

specifying, in sequence, conditions defining limits of the signal portions to be displayed;

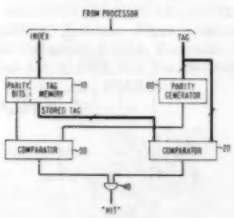
specifying, for each condition, values of signals within each set; and

beginning display of the signals whenever the specified values for one of the defined limits occurs and ending display whenever the specified values for another of the defined limits occur.

4,483,003
FAST PARITY CHECKING IN CACHE TAG MEMORY

David D. Beal, Boulder, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 21, 1982, Ser. No. 400,459
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—51 **5 Claims**



1. In a cache memory, apparatus for determining a cache memory hit comprising:

storage means addressed by a prescribed part of a main memory address for retaining stored tag information which when compared to the remaining part of the main memory address describes a cache memory hit condition and for retaining stored parity information generated over the stored tag information,

means for generating a parity bit over said remaining part of the main memory address on a main memory read operation simultaneously with the read operation,

means for comparing said stored parity information with said generated parity bit,

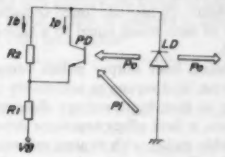
means for comparing said stored tag information with said remaining part of the main memory address, and

means responsive to said two means for comparing for determining a cache memory hit.

4,483,004
LASER FUNCTIONAL DEVICE

Humio Inaba; Hiromasa Ito, and Yoh Ogawa, all of Sendai, Japan, assignors to Tohoku University, Sendai, Japan

Filed Mar. 25, 1982, Ser. No. 361,816
Claims priority, application Japan, Sep. 25, 1981, 56-150726
Int. Cl.³ H01S *3/096*
U.S. Cl. 372—8 **7 Claims**



1. An optoelectronic laser device for carrying out a desired function, said device comprising:

a laser emitting element for emitting a coherent light in response to an exciting electric current that is in excess of the threshold current of the laser emitting element, and

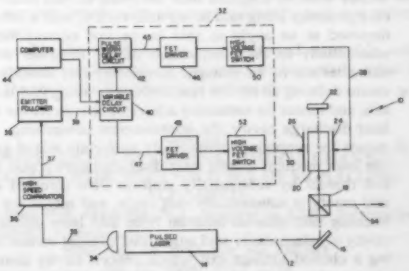
a photoelectric converting element for converting at least a part of said coherent light emitted by said laser emitting element to an electric current;

means for optically and electrically connecting said laser emitting element and said photoelectric converting element in a photoelectric loop for accomplishing positive feedback excitation between said laser emitting element and said photoelectric converting element under which said electric current is added in phase to said exciting electric current to the point of saturation of said photoelectric converting element, said light-emitting element providing a light output operative in accordance with a desired function.

4,483,005
AFFECTING LASER BEAM PULSE WIDTH

Donald V. Smart, Cohasset, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Sep. 24, 1981, Ser. No. 305,274
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—25 **13 Claims**



1. Apparatus comprising

a pulsed laser providing a beam having an initial plane of polarization of radiation, said beam being in pulses having a laser output pulse width in time,

means to rotate the plane of polarization of radiation in said beam passing through it when a voltage is applied,

said means to rotate being positioned to have said beam from said laser pass through it,

a reflector to reflect said beam passing through said means to rotate back through said means to rotate,

a polarizer means for having said reflected beam from said means to rotate pass through it,

and for passing without deflection radiation with an initial plane of polarization and for deflecting into an output beam radiation with a rotated plane of polarization rotated from said initial plane of polarization, and

means to selectively apply a voltage to said means to rotate for a length of time shorter than said laser output pulse width to selectively provide timed-reduced output pulses, said length of time being equal to a time-reduced output pulse width,

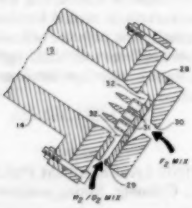
said time-reduced laser output pulses being repeated at a repetition rate, said means to selectively apply a voltage comprising; a first high voltage field effect transistor switch means, a field effect transistor driver, and a selectively variable pulse with timing means; said means to rotate, said reflector, said polarizer and said means to selectively apply a voltage are all located external to said pulsed, laser.

4,483,006

AXIAL FLOW LASER CAVITY

Paul J. Ortwerth, Rio Rancho, and Alan I. Lampson, Albuquerque, both of N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 6, 1982, Ser. No. 375,621
Int. Cl.³ H01S *3/22*
U.S. Cl. 372—58 **2 Claims**



1. In an improved pulsed gas laser device which includes:

a. a generally tubular laser discharge tube defining a laser discharge cavity therein and lasing axis therethrough;

b. a laser window disposed near each end of said laser discharge cavity along said lasing axis, each of said windows disposed at an angle to said lasing axis corresponding substantially to the complement of the Brewster angle characteristic of the material comprising said windows;

c. means defining an optical resonant cavity along said lasing axis; and means for sustaining a laser discharge within said laser discharge cavity, the improvement comprising:

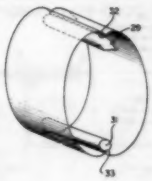
d. means for supplying substantially uniformly mixed gaseous laser medium to said laser discharge cavity near one end thereof by substantially uniform flow directed into said cavity at substantially said angle, and means for exhausting said gaseous medium from said laser discharge cavity at substantially said angle, said exhaust means having a choked exhaust exit which cancels cavity disturbances and acoustic wave reflections in the lasing cavity such that shock waves generated downstream of said lasing cavity are not reflected back into said cavity in that the exciting gases are traveling at about the speed of sound and the sonic flow blocks such reflection from re-entering said laser discharge cavity.

4,483,007

ENERGY TRANSMISSION WITH RESPECT TO CONVEX SOURCES AND RECEIVERS

Roland Winston, Chicago, Ill., assignor to The University of Chicago, Chicago, Ill.

Continuation of Ser. No. 69,326, Aug. 24, 1979,. This application Jul. 10, 1981, Ser. No. 282,232
Int. Cl.³ H01S *3/093*
U.S. Cl. 372—72 **7 Claims**



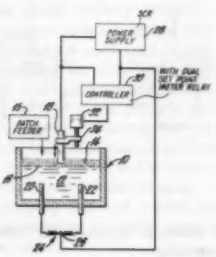
1. In a device for transmission of radiant energy from a longitudinally-extending source having a convex surface to a longitudinally-extending receiver having a convex surface wherein a longitudinally-extending wall portion positioned adjacent either said source, or said receiver, or both said source and receiver, provides a means for reflecting radiant energy emanating from said source onto said receiver, the improvement comprising a non-imaging concentrator which includes a concave reflective wall portion which is non-elliptical in two dimensional cross-section and shaped and positioned with respect to said receiver and source so that energy rays emanating from said source along its length at a first predetermined angle and impinging upon said reflective wall portion are made to be incident upon said receiver at a second predetermined angle, in a single reflection from said wall portion.

4,483,008

ARC GAP CONTROLLER FOR GLASS-MELTING FURNACE

Eugene C. Varrasso, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 26, 1982, Ser. No. 342,856
Int. Cl.³ C03B *5/027*
U.S. Cl. 373—27 **8 Claims**



4. An apparatus for controlling the position of an electrode in relation to an upper surface of a body of molten glass in an arc glass-melting furnace to maintain a stable arc, said apparatus comprising: a constant current producing power supply means connected to said electrode for providing an alternating current of constant magnitude thereto to cause a voltage drop across said arc electrode; means for sensing the voltage applied to said electrode by said current providing means; means associated with said sensing means for determining if the voltage sensed by said sensing means is within a predetermined range of voltages, said determining means providing a control signal

when said sensed voltage is not within said predetermined range of voltages; and means connected to said electrode and said determining mans for modifying the position of said electrode in relation to said upper surface of said body of molten galss in response to said control signal to bring said sensed voltage within said predetermined range of voltages.

4,483,009

TRANVERSAL EQUALIZER

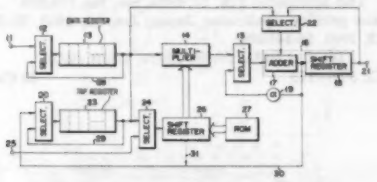
Shunsuke Honda, Yokohama; Hideo Suzuki, Kawasaki, and Haruki Yahata, Fujisawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 24, 1981, Ser. No. 305,227

Claims priority, application Japan, Sep. 24, 1980, 55-132631; Sep. 24, 1980, 55-132632

Int. Cl.³ H04B *3/14*

U.S. Cl. 375—14 **7 Claims**



1. A transversal equalizer comprising:

a transversal filter which includes means for performing a convolution of an unequalized signal and a tap weight to equalize the unequalized signal;

means in an automatic equalization mode for performing a correlation of the unequalized signal with an error signal and for updating the tap weight according to the correlation result;

means for storing fixed tap weights; and

means for, in a fixed equalization mode and the automatic equalization mode, selectively reading out a fixed tap weight from said storing means and for inputting the readout fixed tap weight to said transversal filter.

4,483,010

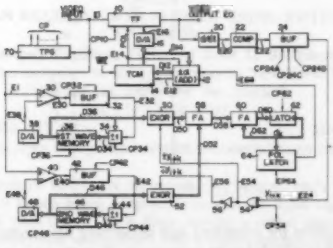
AUTOMATIC EQUALIZER

Shigekazu Takashima, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 1, 1982, Ser. No. 394,440

Int. Cl.³ H04B *3/18*

U.S. Cl. 375—14 **22 Claims**



15. A correlator comprising:

wave means responsive to a first reference signal, for dividing a wave form of said first reference signal into fragments along time base, for providing a first wave signal which contains amplitude information of odd number fragments of the divided first reference signal, and for providing a second wave signal which contains amplitude information of even number fragments of the divided first reference signal;

subtraction means coupled to said wave means and responsive to a second reference signal corresponding to said first reference signal as well as responsive to a subtraction control signal, for subtracting one fragment of said first wave signal from another fragment of said second wave signal when said subtraction control signal has one level, for subtracting one fragment of said second wave signal from another fragment of said first wave signal when said subtraction control signal has another level, and for multiplying a result of the subtraction by said second reference signal in order to provide a correlation signal; and

accumulation means coupled to said subtracting means, for accumulating said correlation signal to provide a correlation output signal which is used for a correlation control of said first reference signal.

4,483,011

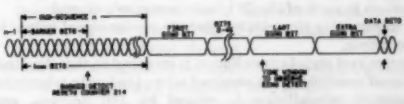
NARROW BAND TELEVISION TRANSMISSION SYSTEM

Daniel P. Brown, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 346,976, Feb. 8, 1982, abandoned, which is a division of Ser. No. 83,431, Oct. 10, 1979, Pat. No. 4,317,130. This application Apr. 26, 1984, Ser. No. 603,991

Int. Cl.³ H04L *17/00*

U.S. Cl. 375—25 **3 Claims**



1. An asynchronous information transmission system comprising:

a transmitter and a receiver, said transmitter adapted to transmit information to said receiver, and said receiver adapted to receive information from said transmitter, said transmitter including:

code word generating means for generating at least one code word at a first predetermined bit rate to enable identification of said transmitter at said receiver, the bit rate of the code word being significantly slower than the bit rate of the transmitted information which follows the code word; and

preamble generating means for generating a preamble at a higher bit rate than said code word, said preamble having peaked autocorrelation properties;

said receiver including:

code word detecting means to detect said at least one code word to enable said receiver to identify said transmitter; and

preamble detecting means to detect said preamble with peaked autocorrelation properties to accurately point to the start of said transmitted information.

4,483,012

DIFFERENTIALLY CONVOLUTIONAL CHANNEL CODING WITH EXPANDED SET OF SIGNALLING ALPHABETS

Lee-Fang Wei, Matawan, N.J., assignor to AT&T Information Systems, Holmdel, N.J.

Filed Apr. 18, 1983, Ser. No. 486,081

Int. Cl.³ H04L *5/12, 1/10*

U.S. Cl. 375—27 **6 Claims**

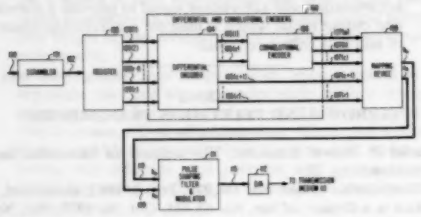
1. A method for transmitting a bit sequence by modulating a carrier signal to sequentially assume one of a plurality of discrete signal values, comprising the steps of:

(a) differentially encoding at least one bit in each group of r

bits in said sequence in accordance with the values of previous differentially encoded r bit groups,

(b) expanding each differentially encoded r bit group into a group of $r+1$ bits by a convolutional coding process utilizing m interval states, the current state of said convolutional code being determined by m bits in previous differentially encoded r bit groups,

(c) selecting one out of 2^{r+1} discrete carrier signal values in a signal constellation as a function of each expanded $r+1$ bit group, the selection being made so that 2^{r-q} carrier signal values correspond to each permitted transition from one internal state of the coding process to m possible following states of the coding process, where q is an



integer such that 2^q is the number of permitted following states from a current given state, and that the smallest of the minimum distances among the 2^{r-q} carrier signal values in each of the 2^{q+1} sets is maximized, and

(d) transmitting the selected discrete carrier signal values in sequence,

wherein said signal constellation is arranged so that the same signal constellation is obtained when (and only when) the original constellation is rotated by 180 degrees, and wherein

rotation of said constellation by 180 degrees produces the same effect on said transmitted discrete carrier signal values as inversion of said at least one differentially encoded bit in each r bit group.

4,483,013

X-RAY RADIATION CONTROL METHOD AND APPARATUS

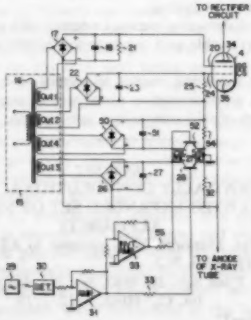
Hideki Sato, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 10, 1982, Ser. No. 440,589

Claims priority, application Japan, Nov. 12, 1981, 56-181458

Int. Cl.³ H05G *1/30, 1/64*

U.S. Cl. 378—112 **27 Claims**



1. A method for regulating the voltage supply to an Xray tube, comprising the steps of:

(1) applying a high-voltage DC supply voltage to voltage controlled resistance means, responsive to signals applied to a control input, for producing a regulated supply voltage;

(2) applying said regulated supply voltage to said X-ray tube;

(3) producing a first control signal in response to low frequency variations in an input control signal;

(4) producing a second control signal in response to high frequency variations in said input control signal; and

(5) applying said first and second control signals to said control input of said voltage controlled resistance means to control said regulation of said supply voltage.

4,483,014

MEDICAL X-RAY INSPECTION APPARATUS

Naoki Yuguchi, Yokohama, and Keiichi Kawasaki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

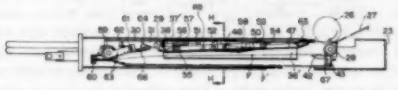
Continuation of Ser. No. 335,757, Dec. 30, 1981, abandoned.

This application Feb. 10, 1984, Ser. No. 579,029

Claims priority, application Japan, Jan. 13, 1981, 56-3591; Sep. 18, 1981, 56-148609

Int. Cl.³ B65H *29/00, 29/34*; C03B *19/10*

U.S. Cl. 378—173 **23 Claims**



1. A magazine comprising:

means for holding the forward end of a sheet;

first means for dividing said magazine into a containing space and a containing chamber and for supporting each side of the sheet; and

second means for keeping the rearward end of the sheet contained in the containing chamber, said second means being movable into and out of the path of movement of the sheet from the containing space to the containing chamber.

4,483,015

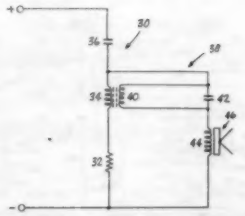
COMPENSATION NETWORK FOR LOUDSPEAKERS

John Strohbeen, 160 Bergen St., Brooklyn, N.Y. 11201

Filed Sep. 29, 1982, Ser. No. 428,089

Int. Cl.³ H04R *3/08*

U.S. Cl. 381—103 **2 Claims**



2. A system for extending and smoothing base response of a loudspeaker which has an impedance characteristic in the low base frequency range exhibiting a first and second impedance peak at a first and second frequency comprising: a series resonant circuit having an inductor, capacitor and resistor connected in series, said series resonant circuit being tuned to the frequency of the impedance peak of said loudspeaker, said loudspeaker being connected in parallel with the series connected inductor and resistor, and a second inductor loosely

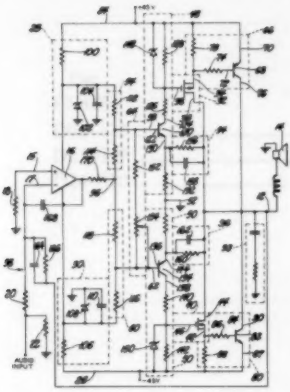
inductively coupled to said first inductor to provide a tuned transformer, said tuned transformer being tuned to the second frequency at which the speaker exhibits said second impedance peak to reduce the second impedance peak.

4,483,016

AUDIO AMPLIFIER

Peter A. Hochstein, 14020 Fifteen Mile Rd., Sterling Heights, Mich. 48077, and Kelvin Shih, 908 Devonshire Rd., Brighton, Mich. 48116

Filed Sep. 23, 1982, Ser. No. 422,260
Int. Cl.³ H03F 3/16
U.S. Cl. 381—120 **27 Claims**



1. An audio amplifier circuit of the AB class including differential amplifier stage (16) having an input (17) for receiving and processing an input auido signal to provide a primary audio signal, a circuit transducer output (12), a primary amplification stage for receiving said primary audio signal and amplifying same to provide a transducer signal to said circuit transducer output (12), bipolar power supply connections (24, 26) for supplying electrical current, said AB class amplifier circuit characterized by said primary amplification stage including at least two MOS-FETS (metal oxide semiconductor-field-effect transistors) (32, 40) in common source connection between said power supply connections and said circuit transducer output (12) and a level-shifting driver stage (48, 50) for driving each MOS-FET.

4,483,017

PATTERN RECOGNITION SYSTEM USING SWITCHED CAPACITORS

Daniel Hampel, Westfield, N.J., and John L. Bradshaw, Hatboro, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,685
Int. Cl.³ G06K 9/00
U.S. Cl. 382—17 **11 Claims**

1. In a pattern recognition system the combination comprising:

a multiplexer having N inputs and an output, each one of said N inputs being adapted to receive an input signal;

M band pass filters, each filter having a signal input connected to said multiplexer and a signal output, and each filter including a capacitor C_{fi} and means for switching the capacitor at a particular frequency f_{fi} for producing a desired particular equivalent resistance within each filter, where $1 \leqq i \leqq M$;

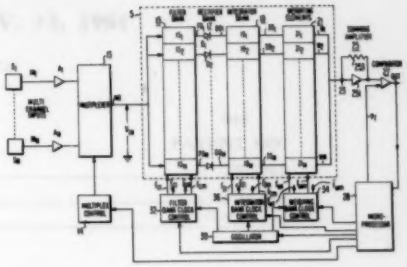
means connecting said filter signal inputs to said multiplexer output;

M integrators, one integrator per filter, each integrator having a signal input and a signal output and each integrator including a capacitor C_{fi} and means for switching the capacitor at a particular frequency f_{fi} for producing a desired particular equivalent resistance within each integrator;

M rectifying means, one rectifying means per filter, each rectifying means being connected between the signal output of a filter and the signal input of an integrator;

a summing amplifier having a summing node; and

M weighting elements, one weighting element per integrator, each weighting element having a signal input and a



signal output and including a capacitor $C_{\mu i}$ and means for switching the capacitor at a particular frequency $f_{\mu i}$ for producing a desired particular equivalent resistance in the signal path between said signal input and said signal output of each weighting element;

means connecting the signal input of each weighting element to its corresponding integrator output; and

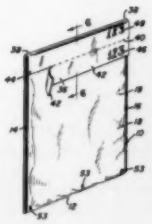
means connecting the signal output of each weighting element to said summing node; where M and N are integers greater than one.

4,483,018

HIGH INTEGRITY TAMPER RESISTANT CONTAINER

John W. Whelan, Wynnewood, Pa., assignor to Impakt Products, Inc., Narberth, Pa.

Continuation of Ser. No. 232,649, Feb. 9, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,196
Int. Cl.³ B65D 73/34
U.S. Cl. 383—5 **2 Claims**



1. A high integrity, tamper resistant security container, comprising:

(a) an enclosure formed from an overlying panel and an underlying panel, both made of a shear and impact resistant thermoplastic material and having an access opening along an edge of the enclosure for insertion of items into the enclosure;

(b) a flap formed as part of the underlying panel and extending beyond the overlying panel, which is foldable to a position juxtaposed over the overlying panel so as to close the access opening upon sealing;

(c) areas of adhesive material on each of said flap and said

overlying panel formed as parallel bands substantially identical in area along and proximate to the access opening, protected by peelable strips which are removed prior to sealing the access opening, each area positioned so as to mate the flap and the overlying panel when they are pressed together and so as to produce a substantially permanent tamper resistant closure of the access opening;

wherein the flap has an end portion beyond the area of adhesive material thereon which is demarcated by a first line of perforations between the free end of the flap and the area of adhesive so that the end portion is detachable from the remainder of the flap along the first line of perforations, the end portion and the remainder of the flap each bearing identical identification indicia thereon;

and wherein the flap has a second line of perforations across the width thereof running through both the area of adhesive material, and the identification indicia thereon, the arrangement of the second line of perforations being such that attempts to open the enclosure along the access opening will disrupt the continuity of the flap and the identification indicia.

DESIGN PATENTS

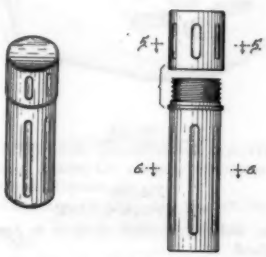
GRANTED NOV. 13, 1984

ERRATA

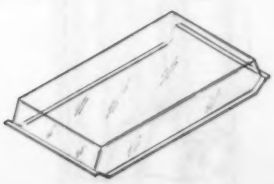
For CLASS	See PATENT NO.
D04–121	276,291
D23–019	276,299
D24–010	276,374

276,284
SHIRT
Harold H. Denhof, 243 W. 70th St., New York, N.Y. 10023
Filed May 15, 1984, Ser. No. 610,519
Term of patent 14 years
U.S. Cl. D2—217

276,285
WELDING ELECTRODE STORAGE CANISTER
Carlyn D. Tober, 1371 Downing St., Benton Harbor, Mich. 49022, and Michael W. Wood, Benton Harbor, Mich., assignors to Carlyn D. Tober, Benton Harbor, Mich.
Filed Jul. 22, 1981, Ser. No. 285,791
Term of patent 14 years
U.S. Cl. D3—30.1



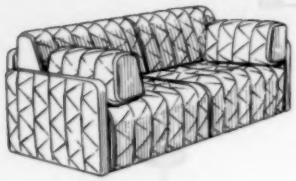
276,286
MICROFICHE BOX COVER
Donald L. Evans, DeForest, Wis., assignor to Don Evans, Inc., DeForest, Wis.
Filed May 21, 1982, Ser. No. 380,628
Term of patent 14 years
U.S. Cl. D3—35



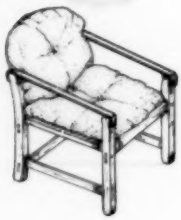
276,287
FLOWER POT STAND
Karl Sturcz, 5253 W. Hutchinson, Chicago, Ill. 60641, and Mathias Csulits, 1651 W. Farragaut, Chicago, Ill. 60640
Filed Jan. 16, 1981, Ser. No. 225,626
Term of patent 14 years
U.S. Cl. D6—403

276,288
AUTOMOBILE BUCKET SEAT COVER OR SIMILAR ARTICLE
Fern Kitchen, Providence, Utah, assignor to Alco Manufacturing Co., Logan, Utah
Filed Nov. 12, 1981, Ser. No. 320,202
Term of patent 14 years
U.S. Cl. D6—502

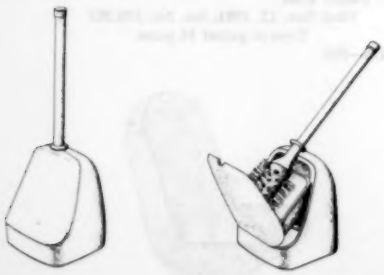
276,289
UPHOLSTERED SETTEE
Ernst Lüthy, Klingnau, Switzerland, assignor to C & D Consulting & Design AG, Engelberg, Switzerland
Filed Mar. 11, 1981, Ser. No. 242,587
Claims priority, application Switzerland, Sep. 18, 1980, 70690
Term of patent 14 years
U.S. Cl. D6—381



276,290
ARMCHAIR
Brian J. Shore, 74 Lime St., Newburyport, Mass. 01950
Filed Jul. 14, 1981, Ser. No. 283,290
Term of patent 14 years
U.S. Cl. D6—379

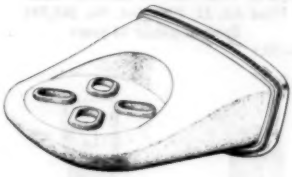


276,291
BATHROOM BRUSH HOLDER WITH BRUSH
Jersy Boroch, Saint Ismier, France, assignor to Allibert S.A., Grenoble, France
Filed Apr. 15, 1982, Ser. No. 368,819
Term of patent 14 years
U.S. Cl. D4—121

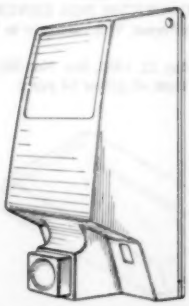


276,292
SOAP HOLDER
Lonnie Rivera, and Irene D. Rivera, both of 443 Marie, St. Louis, Mo. 63135
Filed May 7, 1982, Ser. No. 375,956
Term of patent 14 years
U.S. Cl. D6—536

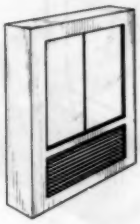
276,293
WALL-MOUNTED DRINKING GLASS HOLDER
Jersy Boroch, Saint Ismier, France, assignor to Allibert S.A., Grenoble, France
Filed Apr. 15, 1982, Ser. No. 368,822
Term of patent 14 years
U.S. Cl. D6—535



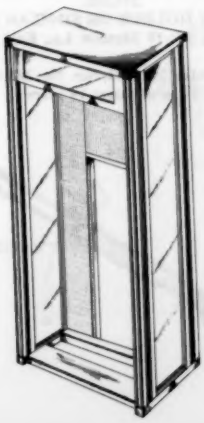
276,294
LIQUID DISPENSER
Stewart Banks, Milford, England, assignor to Appor Limited, Derby, England
Filed May 19, 1982, Ser. No. 382,994
Claims priority, application United Kingdom, Apr. 28, 1982, 1006415
Term of patent 14 years
U.S. Cl. D6—545



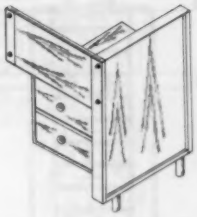
276,295
MEDICINE CABINET
William G. Hayden, Elkhart, Ind., assignor to Chemcraft, Inc., Elkhart, Ind.
Filed Mar. 1, 1982, Ser. No. 353,044
Term of patent 14 years
U.S. Cl. D6—561



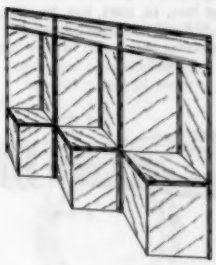
276,296
OUTDOOR TELEPHONE BOOTH
Jonathan Cooper, Athens, Ga., assignor to Royston Manufacturing Corporation, Royston, Ga.
Filed Apr. 19, 1982, Ser. No. 369,745
Term of patent 14 years
U.S. Cl. D6—555



276,297
RETURN CABINET FOR A LAVETORY BASIN
James J. Palka, Arlington Heights, Ill., assignor to Pace Industries Inc., Chicago, Ill.
Filed Apr. 22, 1982, Ser. No. 370,948
Term of patent 14 years
U.S. Cl. D6—445

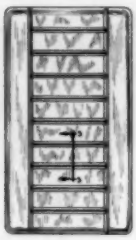


276,298
DISPLAY STAND
Melvin M. Miller, Bloomington, Ind., assignor to Channel-Kor Systems, Inc., Bloomington, Ind.
Filed Mar. 18, 1982, Ser. No. 359,486
Term of patent 14 years
U.S. Cl. D6—470

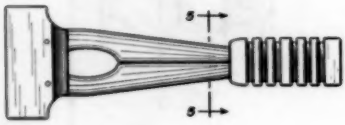


276,299
WATER BED AIR BLEEDER
Patrick O. Reardon, 2701 Valley Dr., Manhattan Beach, Calif. 90266
Filed Apr. 12, 1982, Ser. No. 367,272
Term of patent 14 years
U.S. Cl. D23—19

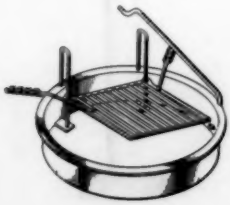
276,300
CABINET DOOR
Richard M. Moodie, 7775 Walton Rd., Walton Hills, Ohio 44146
Filed Sep. 30, 1982, Ser. No. 431,747
Term of patent 14 years
U.S. Cl. D6—494



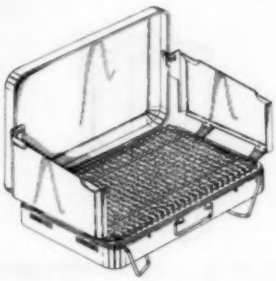
276,301
COMBINED SEAFOOD MALLET, CRACKER AND KNIFE
Robert H. Burrage, Stonewood Rd., MR 57, York, Pa. 17402
Filed Nov. 16, 1981, Ser. No. 321,936
Term of patent 14 years
U.S. Cl. D7—101



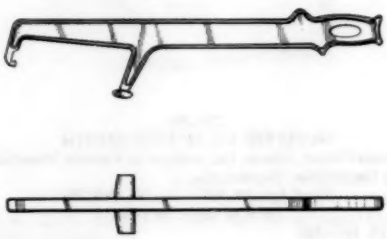
276,302
CAMPFIRE GRILL OR SIMILAR ARTICLE
Steven M. Thomas, and Craig R. Thomas, both of Cherokee, Iowa, assignors to R. J. Thomas Manufacturing Co., Cherokee, Iowa
Filed Apr. 1, 1982, Ser. No. 364,501
Term of patent 14 years
U.S. Cl. D7—332



276,303
GAS BARBEQUE
Ming K. Chan, 1st Floor, 58 Hung To Rd., Kwun Tong, Kowloon, Hong Kong
Filed Jun. 7, 1982, Ser. No. 385,468
Claims priority, application United Kingdom, Mar. 22, 1982, 1005737
Term of patent 14 years
U.S. Cl. D7—337

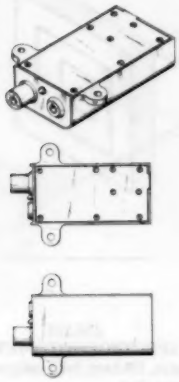


276,304
PLASTIC PAIL LID REMOVAL TOOL
John DiFede, 24878 Tioga Rd., Hayward, Calif. 94544
Filed Jul. 8, 1982, Ser. No. 396,415
Term of patent 14 years
U.S. Cl. D8—40

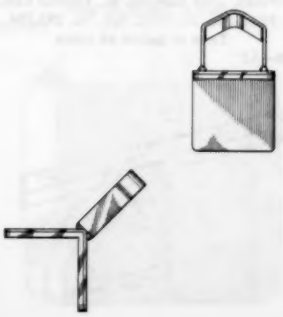


276,305
CHUCK KEY HOLDER OR SIMILAR ARTICLE
W. Colton Hough, Sr., 18 Meadow La., East Williston, N.Y. 11596
Filed May 24, 1982, Ser. No. 381,630
Term of patent 14 years
U.S. Cl. D8—71

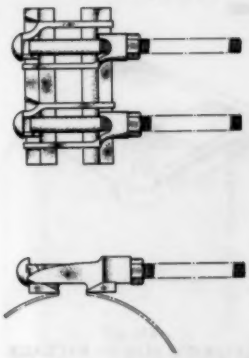
276,306
VEHICULAR SECURITY LOCK HOUSING
Earl W. Turner, Brockton, and George Lyall, Plymouth, both of Mass., assignors to Audiovox Corp., Hauppage, N.Y.
Filed Jun. 25, 1982, Ser. No. 392,023
Term of patent 14 years
U.S. Cl. D8—330



276,307
TIE-DOWN BRACKET FOR CLAMPING SHEET METAL ROLL TO CARRIER FLATBED
Michael J. Hess, 804 Jefferson, Three Rivers, Mich. 49093
Filed Dec. 13, 1982, Ser. No. 449,090
Term of patent 14 years
U.S. Cl. D8—356



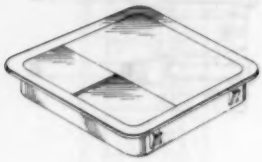
276,308
LUG PAIR UNIT FOR A PIPE CLAMP
James C. Morriss Jr., 140 Northwood, Nash, Tex. 75569
Filed Feb. 26, 1982, Ser. No. 352,942
Term of patent 14 years
U.S. Cl. D8—396



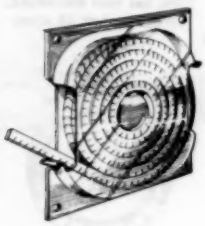
276,309
LOCK WASHER ASSEMBLY
Bengt O. Frieberg, 869 Picaacho, La Habra Heights, Calif. 90631
Filed Feb. 12, 1982, Ser. No. 348,291
The portion of the term of this patent subsequent to Apr. 13, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—399

276,310
HEX TRANSFER WASHER
Bengt O. Frieberg, 869 Picaacho Rd., La Habra Heights, Calif. 90631
Filed Jul. 19, 1982, Ser. No. 399,800
The portion of the term of this patent subsequent to Jul. 26, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—399

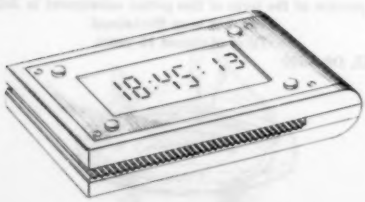
276,311
CABLE BUSHING FOR OFFICE FURNITURE, PARTITIONS AND THE LIKE
Bernard T. Coursoyer, Holden, and Norman A. Hedstrom, Worcester, both of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Mar. 25, 1982, Ser. No. 361,674
Term of patent 14 years
U.S. Cl. D8—400



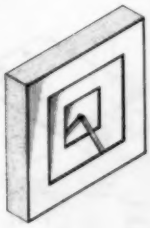
276,312
MARKING SLEEVE PACKAGE
Göran Lööf, Gullspång, and Lars Skarin, Otterbäcken, both of Sweden, assignors to Partex Fabriksaktiebolag, Gullspång, Sweden
Filed Nov. 23, 1981, Ser. No. 324,325
Claims priority, application Sweden, May 25, 1981, 81-1239
Term of patent 14 years
U.S. Cl. D9—337



276,313
CLIP-ON WATCH
Jan H. Matthias, 1509 N. Beverly Dr., Beverly Hills, Calif. 90210
Filed Apr. 15, 1982, Ser. No. 368,885
Term of patent 14 years
U.S. Cl. D10—15

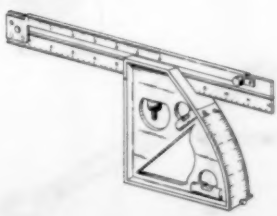


276,314
CLOCK OR THE LIKE
Mark A. Walch, 500 N. Roosevelt Blvd., Falls Church, Va. 22044
Filed May 25, 1982, Ser. No. 381,902
Term of patent 14 years
U.S. Cl. D10—25

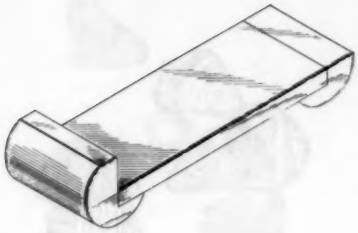


276,315
SPECTROPHOTOMETER
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Apr. 7, 1982, Ser. No. 366,200
Term of patent 14 years
U.S. Cl. D10—46

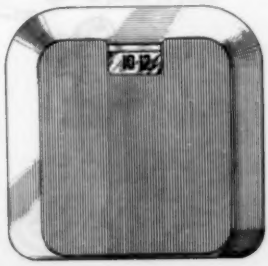
276,316
MULTI-PURPOSE SQUARE
Gregory L. Weeks, 2708 Edwards St., Granite City, Ill. 62040
Filed Jun. 30, 1982, Ser. No. 393,756
Term of patent 14 years
U.S. Cl. D10—62



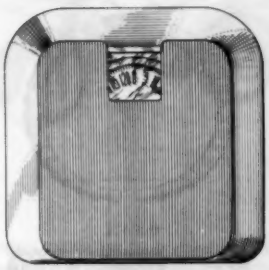
276,317
CONSTANT SINE BAR
Richard A. Schley, 627 Trumbull SE., Warren, Ohio 44484
Filed Sep. 20, 1982, Ser. No. 419,739
Term of patent 14 years
U.S. Cl. D10—65



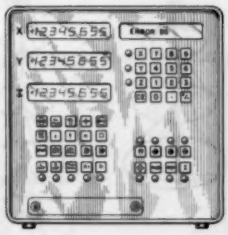
276,318
PERSONAL WEIGHING SCALE
Raymond E. Turner, Kilkenny, Northern Ireland, assignor to Tricolor Corporation, Las Cruces, N. Mex.
Filed Nov. 24, 1981, Ser. No. 324,467
Claims priority, application United Kingdom, May 29, 1981, 1000737
Term of patent 14 years
U.S. Cl. D10—92



276,319
PERSONAL WEIGHING SCALE
Raymond E. Turner, Kilkenny, Ireland, assignor to Tricolor Corporation, Las Cruces, N. Mex.
Filed Nov. 24, 1981, Ser. No. 324,468
Term of patent 14 years
U.S. Cl. D10—92

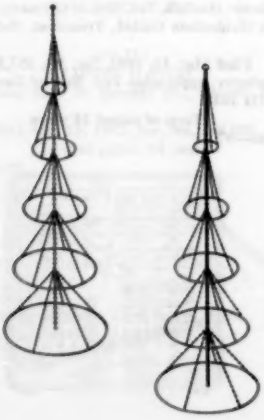


276,320
NUMERICAL COUNTER DISPLAY UNIT
Anton Thalmair, Haslach, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany
Filed Mar. 11, 1982, Ser. No. 357,347
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, MR III 1441
Term of patent 14 years
U.S. Cl. D10—97



276,321
SPRING BRACELET
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Now Marina B Creation Societe Anonyme, Vaduz, Liechtenstein
Filed Nov. 6, 1981, Ser. No. 319,036
Claims priority, application Italy, May 8, 1981, 35804/81[U]
Term of patent 14 years
U.S. Cl. D11—3

276,322
CHRISTMAS TREE MOBILE
Andrew M. Maxwell, and Katherine J. Maxwell, both of 5380 N. Ocean Dr., Riviera Beach, Fla. 33404
Filed Jun. 26, 1981, Ser. No. 277,865
Term of patent 14 years
U.S. Cl. D11—118

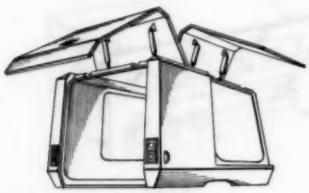


276,323
FIGURINE OF A SAINT BERNARD
Jesûs A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 21, 1981, Ser. No. 303,977
Term of patent 14 years
U.S. Cl. D11—158

276,324
FIGURINE OF A HUNTING DOG
Jesûs A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 21, 1981, Ser. No. 303,979
Term of patent 14 years
U.S. Cl. D11—158

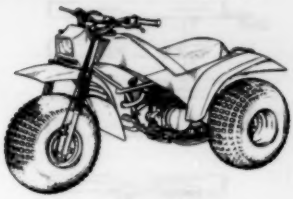
276,325
FIGURINE OF A SIAMESE CAT
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Apr. 30, 1982, Ser. No. 373,792
Term of patent 14 years
U.S. Cl. D11—158

276,326
LOAD BODY
George G. Bell, Jr., Jackson, Miss., assignor to Un-Common Carrier Corp., Jackson, Miss.
Filed Nov. 6, 1981, Ser. No. 320,195
Term of patent 14 years
U.S. Cl. D12—96

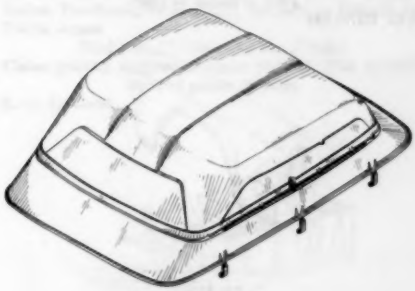


276,327
MOTORCYCLE
Minoru Morioka, Kawagoe, and Tetuo Ogishima, Shiki, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 11, 1982, Ser. No. 357,323
Claims priority, application Japan, Sep. 11, 1981, 56-40261
Term of patent 14 years
U.S. Cl. D12—110

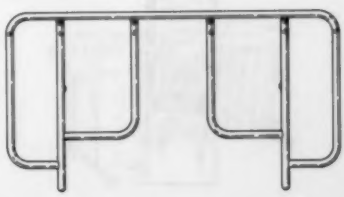
276,328
MOTORTRICYCLE
Atsushi Ishiyama, Tokyo, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Oct. 8, 1982, Ser. No. 433,518
Claims priority, application Japan, Apr. 13, 1982, 57-16107; May 15, 1982, 57-21183
Term of patent 14 years
U.S. Cl. D12—110



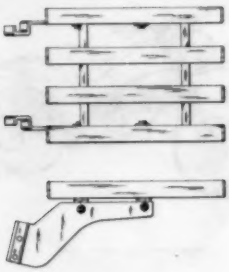
276,329
LUGGAGE CARRIER FOR VEHICLES
John P. Nepper, 9826 Hartman, Omaha, Nebr. 68134
Filed Sep. 30, 1982, Ser. No. 431,839
Term of patent 14 years
U.S. Cl. D12—157



276,330
MOTORCYCLE LUGGAGE RACK
Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Filed May 26, 1982, Ser. No. 382,225
Term of patent 14 years
U.S. Cl. D12—158

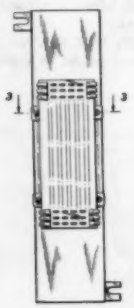


276,331
MOTORCYCLE LUGGAGE RACK
John A. Heiman, Waukesha, Wis., and Walter J. Murzin, Taylor, Mich., assignors to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.
Filed Jun. 16, 1982, Ser. No. 389,020
Term of patent 14 years
U.S. Cl. D12—158

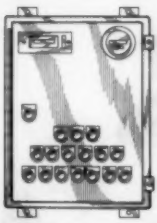


276,332
FRONT FENDER
Jan Wilsgaard, Torslanda, Sweden, assignor to Aktiebolaget Volvo, Gothenburg, Sweden
Filed Oct. 20, 1980, Ser. No. 199,015
Claims priority, application Sweden, Apr. 18, 1980, 80-0808
Term of patent 14 years
U.S. Cl. D12—184

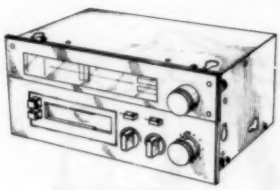
276,333
TELEPHONE TRANSFER RELAY UNIT
Carmine Cupani, Brentwood, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Jul. 12, 1982, Ser. No. 397,428
Term of patent 14 years
U.S. Cl. D13—24



276,334
CONTROL PANEL
William R. Dickerson, Rte. 4, Box 251-A, Three & Twenty School Rd., Easley, S.C. 29640
Filed May 22, 1981, Ser. No. 266,359
Term of patent 14 years
U.S. Cl. D13—35

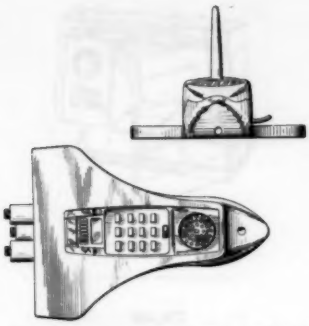


276,335
COMBINED MOTOR VEHICULAR CASSETTE PLAYER AND RADIO
Hiroshi Yoshida, Tokyo, Japan, assignor to Clarion Corporation, Tokyo, Japan
Filed Jan. 27, 1982, Ser. No. 343,299
Term of patent 14 years
U.S. Cl. D14—5



276,336
HAND-HELD MICROPHONE OR SIMILAR ARTICLE
Toenis Kaeo, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jun. 7, 1982, Ser. No. 385,832
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, MR Bd 9 Nr.12736
Term of patent 14 years
U.S. Cl. D14—12

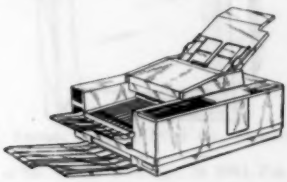
276,337
HANDSET TELEPHONE IN SIMULATED SPACE SHUTTLE FORM
James R. Brennan, 253 Bretton St., Bridgeport, Conn. 06606
Filed Jun. 18, 1982, Ser. No. 389,751
Term of patent 14 years
U.S. Cl. D14—53



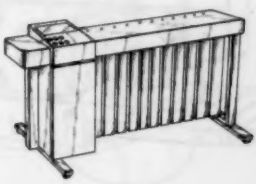
276,338
COMBINED DESK TELEPHONE AND INDEX UNIT
John Pardo, Yonkers, N.Y., assignor to Webcor Electronics, Inc., Plainview, N.Y.
Filed May 20, 1982, Ser. No. 380,048
Term of patent 14 years
U.S. Cl. D14—59

276,339
HOUSING FOR A TELECOMMUNICATION INSTRUMENT BASE
Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Mar. 22, 1982, Ser. No. 360,189
Term of patent 14 years
U.S. Cl. D14—60

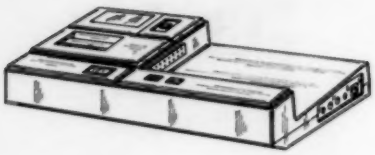
276,340
FACSIMILE TRANSCEIVER
Akitaka Takeuchi, Kodaira; Takeshi Abe, Tokyo, and Hiroshi Endou, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 17, 1982, Ser. No. 379,262
Claims priority, application Japan, Nov. 24, 1981, 56-51678
Term of patent 14 years
U.S. Cl. D14—94



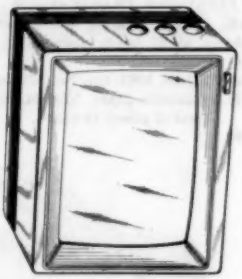
276,341
PASSENGER TICKET CLASSIFYING AND TOTALIZING MACHINE
Yoshiaki Nishida, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Sep. 29, 1982, Ser. No. 428,185
Claims priority, application Japan, May 12, 1982, 57-20099
Term of patent 14 years
U.S. Cl. D14—110



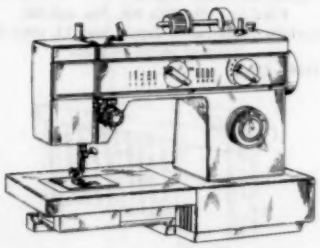
276,342
PRINTER FOR ASSOCIATION WITH COMPUTER
Isao Kitai, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 10, 1982, Ser. No. 386,966
Term of patent 14 years
U.S. Cl. D14—111



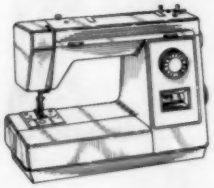
276,343
TELEVISION MONITOR FOR A COMPUTER SYSTEM
Haruyuki Enomoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 24, 1982, Ser. No. 410,991
Claims priority, application Japan, Mar. 2, 1982, 57-8522
Term of patent 14 years
U.S. Cl. D14—113



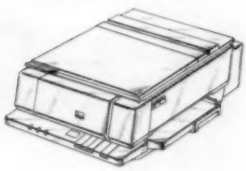
276,344
SEWING MACHINE OR SIMILAR ARTICLE
George La Police, Somerville, and Michael P. Ballone, New Providence, both of N.J., assignors to The Singer Company, Stamford, Conn.
Filed Apr. 22, 1982, Ser. No. 370,810
Term of patent years
U.S. Cl. D15—69



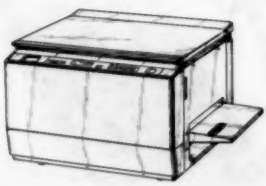
276,345
SEWING MACHINE
Yoshihide Yoneda, 7-401, 53, Taguchiyama 1-chome, Hirakata-shi, Osaka, Japan
Filed Dec. 21, 1981, Ser. No. 333,188
Claims priority, application Japan, Dec. 9, 1981, 56-54388
Term of patent 14 years
U.S. Cl. D15—70



276,346
ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 2, 1982, Ser. No. 404,529
Claims priority, application Japan, Feb. 8, 1982, 57-4957
Term of patent 14 years
U.S. Cl. D16—31



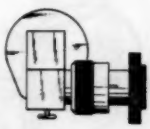
276,347
ELECTRONIC COPYING MACHINE
Yohzoh Matsuzaka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Sep. 9, 1982, Ser. No. 416,365
Claims priority, application Japan, Mar. 10, 1982, 57-9524
Term of patent 14 years
U.S. Cl. D16—31



276,348
CARTRIDGE FOR SENSITIVE PHOTOGRAPHIC FILMS
Claude Thebault, Meylan, France, assignor to Kis France, Grenoble, France
Filed Aug. 12, 1982, Ser. No. 407,600
Claims priority, application France, Mar. 10, 1982, 820831
Term of patent 14 years
U.S. Cl. D16—37

276,349
EYEGLASS FRAME
Luigi Zeni, Via Roma, 30, Locate-Triulzi (Milan), Italy
Filed Sep. 23, 1981, Ser. No. 304,869
Claims priority, application Italy, Apr. 14, 1981, 21485/81[U]
Term of patent 14 years
U.S. Cl. D16—117

276,350
RIGHT ANGLE ADJUSTABLE FOCUS OPTICAL COUPLER
Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.
Filed Jun. 1, 1982, Ser. No. 383,725
Term of patent 14 years
U.S. Cl. D16—130

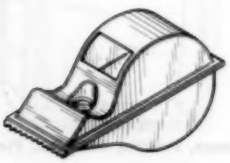


276,351
INVERTED IMAGE MICROSCOPE
Heinrich Janke, Braunfels, and Hans-Kurt Uellenberg, Edingen, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany
Filed May 17, 1983, Ser. No. 495,163
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, MR 241
Term of patent 14 years
U.S. Cl. D16—131

276,352
GUITAR
Charles H. Kaman, Prattling Pond Rd., Farmington, Conn. 06032
Division of Ser. No. 257,190, Apr. 24, 1981, Pat. No. Des. 269,975, which is a continuation-in-part of Ser. No. 210,144, Nov. 24, 1980, abandoned. This application Jul. 11, 1983, Ser. No. 512,624
Term of patent 14 years
U.S. Cl. D17—14

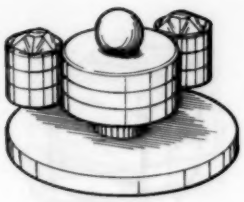
276,353
RIBBON CARTRIDGE
Sydney Shore, 14 Hutchinson Ct., Great Neck, N.Y. 11023
Filed Aug. 9, 1982, Ser. No. 406,694
Term of patent 14 years
U.S. Cl. D18—12

276,354
ADHESIVE TAPE DISPENSER
James E. Spitzer, West Chicago, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.
Filed Jul. 2, 1982, Ser. No. 394,618
Term of patent 14 years
U.S. Cl. D19—69



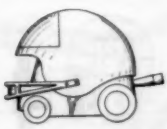
276,355
TOY EXCAVATOR
Lars Sjöholm, Blomstervägan 18, S-331 00 Värnamo, Sweden
Filed May 20, 1982, Ser. No. 380,288
Term of patent 14 years
U.S. Cl. D21—71

276,356
MAGNETIC TOY
Herman W. Fortenberry, 1519 Veronica Pl., Santa Barbara, Calif. 93105
Filed Jul. 6, 1982, Ser. No. 395,812
Term of patent 14 years
U.S. Cl. D21—59

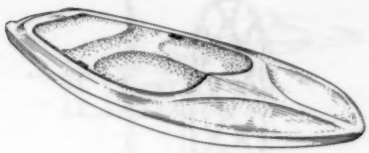


276,357
SIMULATIVE TOY CAR
Katsushi Murakami, Tokyo, Japan, assignor to Mameet Co., Ltd., Tokyo, Japan
Filed Jan. 25, 1982, Ser. No. 342,664
Claims priority, application Japan, Aug. 1, 1981, 56-034178
Term of patent 14 years
U.S. Cl. D21—128

276,358
SIMULATIVE TOY CAR
Katsushi Murakami, Tokyo, Japan, assignor to Mameet Co., Ltd., Tokyo, Japan
Filed Jan. 22, 1982, Ser. No. 341,876
Claims priority, application Japan, Aug. 1, 1981, 56-34177
Term of patent 14 years
U.S. Cl. D21—128

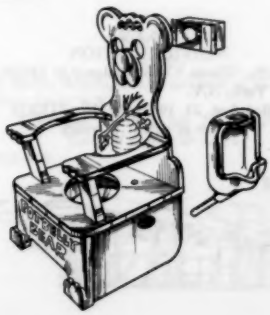


276,359
AQUA PLANING BOARD
Robert L. Churchill, Highland, Calif., assignor to Kransco Manufacturing, Inc., So. San Francisco, Calif.
Continuation-in-part of Ser. No. 121,991, Feb. 19, 1980, Pat. No. Des. 265,116. This application Apr. 19, 1982, Ser. No. 369,561
Term of patent 14 years
U.S. Cl. D21—228

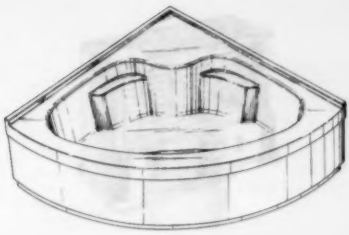


276,360
TRANSPARENT FISH HOOK
Gary L. Sitton, P.O. Box 3543, Beaumont, Tex. 77704
Filed Aug. 13, 1982, Ser. No. 407,771
Term of patent 14 years
U.S. Cl. D22—30

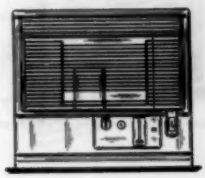
276,361
CHILDREN'S TOILET TRAINING CHAIR
James A. Hyman, Sr., 71 Jordan Dr., Hampton, Va. 23666
Filed Jan. 22, 1982, Ser. No. 341,769
Term of patent 14 years
U.S. Cl. D23—53



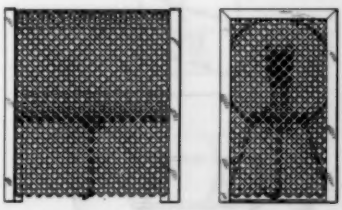
276,362
BATHTUB
William H. Griffiths, St. Albans, England, assignor to 501 Bonsack Baths (London Limited), England
Filed Sep. 28, 1982, Ser. No. 425,854
Claims priority, application United Kingdom, Mar. 29, 1982, 1005846
Term of patent 14 years
U.S. Cl. D23—55



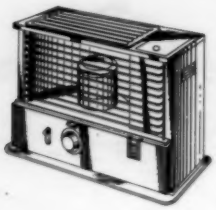
276,363
OIL HEATER
Shigetoshi Hazama; Shuzo Sawa; Matafumi Ikeda, and Akira Esaki, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 7, 1982, Ser. No. 447,711
Claims priority, application Japan, Jun. 15, 1982, 57-27121
Term of patent 14 years
U.S. Cl. D23—122



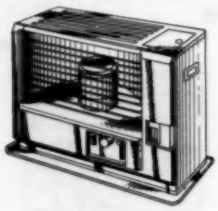
276,364
ELECTRIC SPACE HEATER
Frank Sibert, 85 Washington St., East Orange, N.J. 07017
Continuation-in-part of Ser. No. 333,384, Dec. 22, 1981,. This application Mar. 29, 1984, Ser. No. 594,703
Term of patent 14 years
U.S. Cl. D23—122



276,365
OIL HEATER
Shigetoshi Hazama; Shuzo Sawa; Matafumi Ikeda, and Akira Esaki, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 12, 1982, Ser. No. 441,242
Claims priority, application Japan, May 11, 1982, 57-20455
Term of patent 14 years
U.S. Cl. D23—123

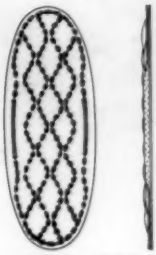


276,366
OIL HEATER
Shigetoshi Hazama; Shuzo Sawa; Matafumi Ikeda, and Akira Esaki, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 12, 1982, Ser. No. 441,490
Claims priority, application Japan, May 11, 1982, 57-20454
Term of patent 14 years
U.S. Cl. D23—123



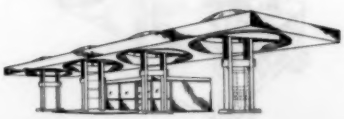
276,367
CASING FOR CONTACT LENS STERILIZER
Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Mar. 12, 1982, Ser. No. 357,591
Term of patent 14 years
U.S. Cl. D24—9

276,368
THIN ABSORBENT PAD
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 26, 1982, Ser. No. 371,907
Term of patent 14 years
U.S. Cl. D24—51

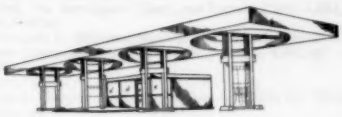


276,369
IN LINE FLOW CONNECTOR FOR A RESPIRATOR
Burrell E. Clawson, 823 W. 16th St., Newport Beach, Calif. 92663, and James Weigl, 2241 Chicago Ave., Riverside, Calif. 92507
Filed Apr. 23, 1982, Ser. No. 371,315
Term of patent 14 years
U.S. Cl. D24—53

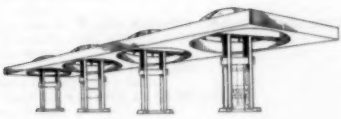
276,370
SERVICE STATION
Charles M. Baffo, Wilton, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Aug. 31, 1982, Ser. No. 413,321
Term of patent 14 years
U.S. Cl. D25—1



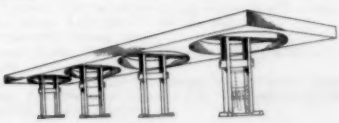
276,371
SERVICE STATION
Charles M. Baffo, Wilton, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Aug. 31, 1982, Ser. No. 413,322
Term of patent 14 years
U.S. Cl. D25—1



276,372
CANOPY
Charles M. Baffo, Wilton, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Aug. 31, 1982, Ser. No. 413,323
Term of patent 14 years
U.S. Cl. D25—56



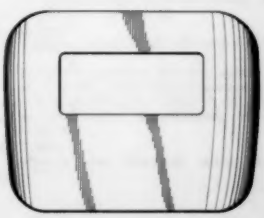
276,373
CANOPY
Charles M. Baffo, Wilton, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Aug. 31, 1982, Ser. No. 413,330
Term of patent 14 years
U.S. Cl. D25—56



276,374
DENTAL ROOT-CANAL BROACH HANDLE
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., Besancon, France
Filed Mar. 23, 1982, Ser. No. 360,910
Claims priority, application Switzerland, Oct. 21, 1981, DM/000991
Term of patent 14 years
U.S. Cl. D24—10

276,375
FLASHLIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Jun. 14, 1982, Ser. No. 387,762
Term of patent 14 years
U.S. Cl. D26—44

276,376
TAIL LIGHT VISOR
Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Filed May 26, 1982, Ser. No. 382,077
Term of patent 14 years
U.S. Cl. D26—139



276,377
SMOKING PIPE
Jack A. Martin, Sparta, N.C., assignor to Sparta Pipes, Inc., Sparta, N.C.
Filed Oct. 12, 1982, Ser. No. 433,944
Term of patent 14 years
U.S. Cl. D27—3

276,378
DENTAL FLOSS HOLDER
Steven K. Levine, 713 Washington St., New York, N.Y. 10014
Filed May 5, 1982, Ser. No. 375,153
Term of patent 14 years
U.S. Cl. D28—64

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF NOVEMBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & Cie GMBH: *See*—
Biedermann, Juergen; and Betzing, Hans, 4,482,474, Cl. 252-311.000.

A/S Dumex (Dumex Ltd.): *See*—
Thorbek, Pia; Bundgaard, Hans; and Larsen, Claus, 4,482,722, Cl. 548-338.000.

Abbott, Bernard J.; Debono, Manuel; and Fukuda, David S., to Eli Lilly and Company. A-21978C cyclic peptides. 4,482,487, Cl. 260-112.50R.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; and Abe, Ryozo, 4,482,925, Cl. 358-342.000.

Abe, Shinya: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Inai, Yuichi; Suzuki, Yoshikazu; and Tagaya, Osamu, 4,482,734, Cl. 560-104.000.

Abe, Takemi: *See*—
Teshima, Koichi; Yamada, Masakazu; Sakurai, Toshiharu; and Abe, Takemi, 4,482,611, Cl. 428-647.000.

Abeta, Sadaharu: *See*—
Tokieda, Takemi; and Abeta, Sadaharu, 4,482,350, Cl. 8-524.000.

Abex Corporation: *See*—
Mulder, James P.; and Meslink, Michael C., 4,481,728, Cl. 37-142.00A.

Abra Inc.: *See*—
Gomes, Daniel, 4,482,186, Cl. 297-441.000.

Abraham, Donald J., to University of Pittsburgh. Sickle cell anemia treatment and compound. 4,482,571, Cl. 424-317.000.

Abthoff, Jorg; Schuster, Hans-Dieter; and Schmidt, Karlwalter, to Daimler-Benz Aktiengesellschaft. Multiple engine drive arrangement. 4,481,841, Cl. 74-661.000.

Acampora, Alfonse, to RCA Corporation. Automatic color control for a digital television receiver. 4,482,916, Cl. 358-27.000.

Ackermann, Horst W.; and Guays, Jean-Pierre, to Societe d'Assistance Technique pour Produits Nestle S.A. Container. 4,482,047, Cl. 206-219.000.

Acla, Howard L.: *See*—
Ritsko, Joseph E.; and Acla, Howard L., 4,482,526, Cl. 423-61.000.

Acosta, Ray. Turbo-compressor apparatus. 4,482,303, Cl. 417-406.000.

Adachi, Hiroyuki: *See*—
Kuge, Tsukasa; Tanigawa, Koichi; and Adachi, Hiroyuki, 4,482,240, Cl. 355-3.0TR.

Adair, Paul C.: *See*—
Arney, Jonathan S.; Wright, Richard F.; Adair, Paul C.; and Williams, Dennis L., 4,482,624, Cl. 430-138.000.

Additainer AB: *See*—
Widman, Jan, 4,482,589, Cl. 428-35.000.

Advanced Micro Devices, Inc.: *See*—
Haskell, Jacob D., 4,481,705, Cl. 29-571.000.

AECI Limited: *See*—
Plichta, Bohumil M. J., 4,482,858, Cl. 324-57.00Q.

Aerospace Corporation, The: *See*—
Schoolar, Richard B.; and Fote, Alfred A., 4,482,881, Cl. 338-15.000.

Affolter, Peter, to Eastman Kodak Company. Disk unit with retaining ring. 4,482,903, Cl. 346-137.000.

AGA AB: *See*—
Stavlo, Lars G., 4,481,972, Cl. 137-376.000.

Agbay, Albert J.; and Thomas, Ralph H., Sr., to Robert Linkletter Associates, Inc. Child resistant safety cap. 4,482,068, Cl. 215-225.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bauer, Walter; Farber, Heinrich; and Schneider, Rudolf, 4,482,233, Cl. 354-312.000.
Engelsmann, Dieter; Hackenberg, Hubert; and Torke, Renate, 4,482,232, Cl. 354-275.000.

Agostini, Louis P., to Staar S. A. Moving drive spindle for slot-type player apparatus. 4,482,993, Cl. 369-263.000.

Aida Engineering, Ltd.: *See*—
Sato, Mitsuo; and Takahashi, Yuu, 4,481,834, Cl. 74-44.000.

Air Products and Chemicals, Inc.: *See*—
Chen, Michael S.; Edwards, James T.; and Ernst, William R., 4,482,529, Cl. 423-243.000.
Orphanides, Gus G., 4,482,690, Cl. 528-64.000.
Toseland, Bernard A.; and Van Court Carr, Richard, 4,482,769, Cl. 568-934.000.

Airey, Anthony C.; and Spiller, Andrew, to British Ceramic Research Association Limited. Method of protecting pigments with transparent crystalline zircon. 4,482,390, Cl. 106-308.00B.

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Miki, Nobuaki; Sobue, Norio; and Yokoyama, Shoji, 4,482,339, Cl. 474-28.000.

Aizawa, Kuniomi; Ohyama, Yasuyoshi; Okuma, Yasuo; Okano, Yoshio; and Kitamura, Youichirou, to Hitachi, Ltd. Transaction handling system. 4,482,802, Cl. 235-379.000.

Akagi, Masanobu, to Nippon Electric Co., Ltd. Virtual addressing system using page field comparisons to selectively validate cache buffer data on read main memory data. 4,482,952, Cl. 364-200.000.

Akashi, Goro; Kitamoto, Tatsuji; and Okita, Tsutomu, to Fuji Photo Co., Ltd. Method for preparing magnetic recording media. 4,482,578, Cl. 427-44.000.

Akashi, Toshihiro: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

Akimoto, Ryosaku; and Ito, Nobuaki, to Mitsubishi Jukogyo Kabushiki Kaisha; and Churyo Engineering Co., Ltd. Air conditioner for vehicles. 4,481,789, Cl. 62-209.000.

Akizuki, Noboru: *See*—
Morimoto, Masafumi; Yanagiuchi, Shigenobu; and Akizuki, Noboru, 4,482,981, Cl. 364-900.000.

Aktiebolaget Bofors: *See*—
Brattstrom, Leif; Mattsson, Kjell; and Arvidsson, Bertil, 4,481,886, Cl. 102-476.000.

Aktiengesellschaft Kuhnle, Kopp & Kausch: *See*—
Brobeck, Helmut; Ludewig, Hartmut; Miribel, Wolfgang; and Stonner, Helmut, 4,482,304, Cl. 417-407.000.

Akzo N.V.: *See*—
Kessler, Erich; and Leeb, Alfons, 4,482,254, Cl. 366-177.000.
Reesink, Johan B., 4,482,698, Cl. 528-242.000.
Schindler, Erich; and Maier, Franz, 4,482,514, Cl. 264-41.000.

Alais, Pierre, to Centre National de la Recherche Scientific. Ultrasonic probing devices. 4,481,823, Cl. 73-626.000.

Albany International Corp.: *See*—
Hartigan, Richard J., Jr., 4,482,601, Cl. 428-234.000.

Alexander, John H., to ITT Industries, Inc. Multilayer doped ceramic capacitor. 4,482,933, Cl. 361-321.000.

Alexis Fire Equipment Co.: *See*—
Morris, Karl J., 4,482,017, Cl. 169-24.000.

Alfa Romeo Auto S.p.A.: *See*—
Rovetta, Alberto, 4,482,288, Cl. 414-728.000.

Alfatechnic AG: *See*—
Dubach, Werner F., 4,482,070, Cl. 215-253.000.

Alford Industries Inc.: *See*—
Amendola, Angel, 4,481,876, Cl. 100-38.000.

Allegheny Ludlum Steel Corporation: *See*—
Datta, Amitava, 4,482,397, Cl. 148-111.000.
Miller, Robert F., 4,482,401, Cl. 148-111.000.

Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., to Colgate-Palmolive Company. Siliconate-coated sodium perborate. 4,482,471, Cl. 252-186.310.

Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., to Colgate-Palmolive Company. Particulate detergent containing siliconate, composition and method for manufacture thereof. 4,482,477, Cl. 252-540.000.

Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., to Colgate-Palmolive Company. Siliconate-coated enzyme. 4,482,630, Cl. 435-187.000.

Allen, Jerome D., to BS&B Safety Systems, Inc. Scored reverse buckling rupture disk apparatus. 4,481,850, Cl. 83-879.000.

Allied Corporation: *See*—
Chin, Hong B.; and Chandrasekaran, Swayambu, 4,482,685, Cl. 526-91.000.
O'Handley, Robert C., 4,482,400, Cl. 148-31.550.

Allwin, Roger P., to MWL Tool & Supply Company. Barrier tool for polished bore receptacle. 4,482,014, Cl. 166-136.000.

Alpern, Marvin; and Genova, Thomas F., to Ethicon, Inc. Sealable container for packaging medical articles in sterile condition. 4,482,053, Cl. 206-439.000.

Alps Electric Co., Ltd.: *See*—
Yamanashi, Fumiaki; Hayashi, Yuzo; and Fujiwara, Yoshiyuki, 4,482,473, Cl. 252-299.100.

Alsop, John E., to Morganite Special Carbons Limited. Making silicon carbide bodies. 4,482,512, Cl. 264-29.100.

Alsthom-Atlantique: *See*—
Grand-Perret, Philippe; and Lerouge, Bernard, 4,482,813, Cl. 290-40.00R.

Alston, Lawrence E.; and Haroutunian, David S., to Polaroid Corporation. Apparatus for obscuring blank spaces between raster lines and hard copies made from screen CRT. 4,482,919, Cl. 358-152.000.

Altemose, James L., to Creative Environments, Inc. Bottle rack. 4,482,065, Cl. 211-74.000.

Altim Control Ky.: *See*—
Hirvonen, Kullervo; and Karonen, Aimo, 4,482,250, Cl. 356-369.000.

Altshuler, John H.; and Farrish, Dean T. Bone marrow transplant method and apparatus. 4,481,946, Cl. 604-4.000.

Amada Company, Limited: *See—*
Aoyagi, Minoru, 4,481,849, Cl. 83-796.000.
Sakurai, Nobuo; and Moriya, Kikuo, 4,481,845, Cl. 83-13.000.

Amano, Katsumi; and Ishii, Takatoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Data transfer system for data entry system. 4,482,955, Cl. 364-200.000.

Amano, Matsuo; Sugawara, Toru; Furuhashi, Toshio; and Imai, Masumi, to Hitachi, Ltd. Engine control method. 4,482,962, Cl. 364-431.110.

Amax Inc.: *See—*
Bousquet, Hubert; Egraz, Jean Bernard; and Ravet, Georges, 4,482,606, Cl. 428-402.200.
Neelameggham, Ramaswami; and Priscu, John C., 4,482,607, Cl. 428-403.000.

Ambrosius, Klaus: *See—*
Franz, Klaus-Dieter; Ambrosius, Klaus; Esselborn, Reiner; and Kieser, Manfred, 4,482,389, Cl. 106-291.000.

Amemiya, Takeshi, to Fujitsu Limited. Picture signal read system. 4,482,922, Cl. 358-282.000.

Amendola, Angel, to Alford Industries Inc. Treatment of foil laminated paperboard. 4,481,876, Cl. 100-38.000.

American Cyanamid Company: *See—*
Kaplan, Joel H.; and Kinstler, Robert C., 4,482,720, Cl. 548-158.000.
Lewellyn, Morris E., 4,482,500, Cl. 260-455.00A.
Maulding, Donald R., 4,482,745, Cl. 568-314.000.

American Filtrona Corporation, 8401: *See—*
Byrne, Stanley W., 4,481,959, Cl. 131-336.000.

American Fitness, Inc.: *See—*
Phillips, Edward H., 4,481,726, Cl. 36-30.00A.

American Home Products Corporation: *See—*
Santroch, George; and Jirkovsky, Ivo, 4,482,714, Cl. 544-343.000.

American Hospital Supply Corporation: *See—*
Borsanyi, Alexander S., 4,482,347, Cl. 604-153.000.

American Science and Engineering, Inc.: *See—*
Bjorkholm, Paul J., 4,482,957, Cl. 364-414.000.

American Tech Manufacturing Inc.: *See—*
Linker, Frank V., 4,481,984, Cl. 140-147.000.

AMP Incorporated: *See—*
Crowley, Daniel J., 4,482,198, Cl. 339-19.000.

Analog Devices, Inc.: *See—*
Bokil, Delip R.; and Narasimhan, Tanjore R., 4,481,708, Cl. 29-588.000.

Anderson, Cary R. Thermal energy meter. 4,482,006, Cl. 165-11.00R.

Anderson, Lynn M., to United States of America, National Aeronautics and Space Administration. Solar energy converter using surface plasma waves. 4,482,778, Cl. 136-246.000.

Anderson, Lynn M., to United States of America, National Aeronautics and Space Administration. Inelastic tunnel diodes. 4,482,779, Cl. 136-255.000.

Anderson, Raymond, to Brag Systems Canada Ltd. Waterline freeze protection system. 4,481,966, Cl. 137-59.000.

Andersson, Clarence A.: *See—*
Burke, Michael A.; and Andersson, Clarence A., 4,482,913, Cl. 357-67.000.

Andoh, Masato: *See—*
Minamisawa, Tsuyoshi; and Andoh, Masato, 4,482,660, Cl. 523-428.000.

Andoh, Munesato: *See—*
Yanagi, Kunio; and Andoh, Munesato, 4,482,160, Cl. 277-12.000.

Andrews, Roderic S.: *See—*
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,482,495, Cl. 260-402.500.

Andrews, Roland E.: *See—*
Jalovec, Lee J.; and Andrews, Roland E., 4,482,861, Cl. 324-77.00B.

Anegawa, Kazuhiro, to Koyo Machine Industries Company, Inc. Automatic chuck for workpieces. 4,482,162, Cl. 279-1.00J.

Anelva Corporation: *See—*
Tsukada, Tsutomu; Wani, Etsuo; Ukai, Katsumi; and Saitoh, Teruo, 4,482,419, Cl. 156-345.000.

Anno, Nobuo: *See—*
Honda, Shoichi; and Anno, Nobuo, 4,481,919, Cl. 123-198.00F.

Anshutz & Co. GmbH: *See—*
Werblinski, Dieter; and Hoffmann, Heino, 4,481,718, Cl. 33-317.00R.

Aoki, Keiji: *See—*
Takimoto, Toshiyuki; Aoki, Keiji; and Sugiyama, Shinichi, 4,481,928, Cl. 123-492.000.

Aoyagi, Minoru, to Amada Company, Limited. Horizontal bandsaw machine. 4,481,849, Cl. 83-796.000.

Aoyama, Takafumi: *See—*
Tabaru, Kazunori; Aoyama, Takafumi; and Kumakura, Toshio, 4,482,623, Cl. 430-137.000.

Apace Research Limited: *See—*
Reeves, Russell R., 4,482,666, Cl. 524-389.000.

Arai, Michio: *See—*
Nishiyama, Kazuo; Yanada, Tetsunosuke; and Arai, Michio, 4,482,393, Cl. 148-1.500.

Araki, Tutomu; and Kuwashima, Hidesumi, to Hitachi, Ltd. Combined valve. 4,481,776, Cl. 60-660.000.

Arata, Tadao: *See—*
Tanaka, Shimaku; and Arata, Tadao, 4,482,085, Cl. 226-187.000.

Arcamone, Federico: *See—*
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,482,565, Cl. 424-270.000.

Archer, Derek J.: *See—*
Jones, Leonard W. N.; Kandlekar, Samuel D.; and Archer, Derek J., 4,482,279, Cl. 412-39.000.

Arditty, Herve : *See—*
Papuchon, Michel; Puech, Claude; and Arditty, Herve , 4,482,248, Cl. 356-346.000.

ARI Technologies, Inc.: *See—*
Hardison, Leslie C., 4,482,524, Cl. 422-170.000.

Arizona Chemical Company: *See—*
Schluenz, Robert W., 4,482,688, Cl. 526-237.000.

Arkans, Edward J., to Kendall Company, The. Sequential compression device. 4,481,937, Cl. 128-24.00R.

Arkla Industries, Inc.: *See—*
Bawel, Fred, 4,481,935, Cl. 126-307.00R.

Armanet, Jean-Michel: *See—*
Nguyen, Van T.; Bellmann, Gunter; and Armanet, Jean-Michel, 4,482,656, Cl. 523-212.000.

Armour Pharmceutical Company: *See—*
Curry, Willie M.; and Farb, David L., 4,482,483, Cl. 260-112.00R.

Arndt, Maurice W. Device for cleaning bee hive frames. 4,481,687, Cl. 6-12.00R.

Arney, Jonathan S.; Wright, Richard F.; Adair, Paul C.; and Williams, Dennis L., to Mead Corporation, The. Photosensitive material employing encapsulated radiation sensitive composition and process for improving sensitivity by sequestering oxygen. 4,482,624, Cl. 430-138.000.

Arvidsson, Bertil: *See—*
Brattstrom, Leif; Mattsson, Kjell; and Arvidsson, Bertil, 4,481,886, Cl. 102-476.000.

ASA S.A.: *See—*
Venot, Jean, 4,481,759, Cl. 57-5.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Ishibashi, Kenzo, 4,482,237, Cl. 354-416.000.

Asahi, Satoshi; Mori, Shigeo; and Takeshita, Yasuhiro, to Idemitsu Kosan Company Limited. Catalyst and process for stereospecific polymerization of α-olefins. 4,482,686, Cl. 526-119.000.

Asanabe, Sadao: *See—*
Nagase, Yukihiko; Kawasaki, Tetsuo; Hiromatsu, Masato; Asanabe, Sadao; and Saki, Kunio, 4,481,867, Cl. 91-487.000.

Asao, Hideo; and Yasuda, Satoru, to Tokyo Juki Industrial Co., Ltd. Piping sewing device. 4,481,895, Cl. 112-121.120.

Asayama, Yoshiaki: *See—*
Miki, Takao; Asayama, Yoshiaki; and Ueyama, Yoshiji, 4,481,926, Cl. 123-463.000.
Miki, Takao; and Asayama, Yoshiaki, 4,481,927, Cl. 123-478.000.

Ashland Oil, Inc.: *See—*
Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., 4,482,653, Cl. 523-144.000.

Asultanei, Alexandru: *See—*
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, 4,482,376, Cl. 75-10.00R.

AT&T Bell Laboratories: *See—*
Auston, David H.; and Smith, Peter R., 4,482,863, Cl. 324-158.00T.
Bacon, Duane E.; Bessette, Jeffrey R.; and Kohl, Paul A., 4,482,443, Cl. 204-129.300.
Beal, David D., 4,483,003, Cl. 371-51.000.
Besomi, Paul R.; Nelson, Ronald J.; and Wilson, Randall B., 4,482,423, Cl. 156-622.000.
Blyler, Lee L., Jr.; and DiMarcello, Frank V., 4,482,204, Cl. 350-96.340.
Bobsin, John H.; and Marouf, Mohamed A., 4,482,997, Cl. 370-62.000.
Dragone, Corrado; and Gans, Michael J., 4,482,897, Cl. 343-779.000.
Dragone, Corrado; and Semplak, Ralph A., 4,482,898, Cl. 343-781.00P.
Dragone, Corrado, 4,482,899, Cl. 343-786.000.
Katzir, Abraham; and Kolodner, Paul R., 4,482,424, Cl. 156-626.000.
Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,482,442, Cl. 204-129.300.
Marouf, Mohamed A.; and Vancil, Paul W., 4,482,998, Cl. 370-62.000.
Ross, David G., 4,482,977, Cl. 364-841.000.

AT&T Information Systems: *See—*
Wei, Lee-Fang, 4,483,012, Cl. 375-27.000.

AT&T Technologies: *See—*
Bacon, Duane E.; Bessette, Jeffrey R.; and Kohl, Paul A., 4,482,443, Cl. 204-129.300.

AT&T Technologies, Inc.: *See—*
Bohannon, William D., Jr.; and Hamilton, Alfred S., 4,482,413, Cl. 156-54.000.
Ouellette, Paul J.; and Riviezzo, Vincent F., 4,482,197, Cl. 339-17.00C.

Ateliers et Chantiers de Bretagne acb: *See—*
Colin, Jean P., 4,482,272, Cl. 405-198.000.

Atlantic Bridge Company Limited: *See—*
Chouinard, Joseph R. C., 4,482,276, Cl. 406-169.000.

Atlas Fahrzeugtechnik GmbH, Firma: *See—*
Stwiorok, Andreas; Stojek, Dieter; Blauhut, Reinhold; Brandner, Burkhard; and Knuefelmann, Manfred, 4,481,912, Cl. 123-90.150.

Atmosphere Furnace Company: *See*—
Keough, William R., 4,482,316, Cl. 432-198.000.
Atobe, Masaaki: *See*—
Yamamoto, Kazuhiro; and Atobe, Masaaki, 4,483,000, Cl. 370-95.000.
Auchapt, Pierre; and Ferlay, Aime , to Commissariat a l'Energie Atomique. Apparatus for dissolving a powder in a liquid solvent. 4,482,343, Cl. 494-56.000.
Audeh, Costandi A., to Mobil Oil Corporation. Methanol conversion process. 4,482,744, Cl. 568-60.000.
Audi NSU Auto Union Aktiengesellschaft: *See*—
Van Basshuysen, Richard; and Stock, Dieter, 4,481,807, Cl. 73-35.000.
Augart, Helmut: *See*—
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Auletti, Craig R., to General Dynamics, Pomona Division. Method of molding foam/aluminum flake microwave lenses. 4,482,513, Cl. 264-39.000.
AUMOND-Fordererbau GmbH Maschinenfabrik: *See*—
Koster, Karl H.; and Gunther, Roland, 4,481,695, Cl. 24-32.000.
Austin, Richard G.; and Michaelson, Robert C., to Exxon Research & Engineering Co. Process for hydroxylating olefins in the presence of an osmium containing catalyst and organic halogenated hydrocarbon co-catalyst. 4,482,763, Cl. 568-860.000.
Auston, David H.; and Smith, Peter R., to AT&T Bell Laboratories. Apparatus and method for measuring electronic response of high speed devices and materials. 4,482,863, Cl. 324-158.00T.
Autologic, S.A.: *See*—
Moyroud, Louis M.; Bongard, Michel; Vernez, Paul A.; and Moulin, Michel, 4,482,225, Cl. 354-5.000.
Automotive Products Limited: *See*—
Jarvis, Roger P.; and Windsor, Harry M., 4,481,843, Cl. 74-866.000.
Awano, Yoshiro: *See*—
Shiramizu, Kousuke; Awano, Yoshiro; Takeyama, Hiroyuki; Sakakibara, Kenji; Okada, Hiroji; and Yamagami, Hiromu, 4,482,797, Cl. 219-137.610.
Awata, Masashi: *See*—
Sakakibara, Hideo; Satoi, Shuzo; Awata, Masashi; Sagai, Hitoshi; Hayashi, Mitsuo; Muto, Naoki; and Takada, Masaki, 4,482,707, Cl. 536-16.800.
Axthammer, Ludwig: *See*—
Wossner, Felix; Axthammer, Ludwig; Heyer, Gunther; and Itzinger, Hermann, 4,482,036, Cl. 188-322.130.
B. D. Wait Co. Limited: *See*—
Shepherd, Charles G., 4,482,181, Cl. 294-12.000.
B. F. Goodrich Company, The: *See*—
Gardner, Keith L.; and Jones, Richard A., 4,482,684, Cl. 526-84.000.
Kramer, James H., 4,482,592, Cl. 428-67.000.
Babcock & Wilcox Company, The: *See*—
Ball, Russell M.; and Womack, Edgar A., Jr., 4,482,519, Cl. 376-216.000.
Bachle, Walter W., to General Signal Corporation. Combined strain relief and cord grip. 4,481,697, Cl. 24-135.00R.
Backlund, John G.; and Gibler, David L., to United States of America, Air Force. Integrated paratroop door. 4,482,113, Cl. 244-129.500.
Bacon, Duane E.; Bessette, Jeffrey R.; and Kohl, Paul A., to AT&T Technologies; and AT&T Bell Laboratories. Photoelectrochemical etching of n-type silicon. 4,482,443, Cl. 204-129.300.
Baermann, Max. Switchable permanent magnet brake. 4,482,034, Cl. 188-165.000.
Baier, Arnold A.: *See*—
Lenahan, James B.; and Baier, Arnold A., 4,482,963, Cl. 364-463.000.
Bailey, David C.; Burberry, Lee M.; Trimble, Donald E.; Bardos, Andrew M.; and Perry, Philip M., to Harris Corporation. Resonant galvanometer scanner system employing precision linear pixel generation. 4,482,902, Cl. 346-108.000.
Bailey, Joseph: *See*—
Twist, Peter J.; Bailey, Joseph; Briggs, Stuart P.; Mijovic, Miroslav V.; and Southby, David T., 4,482,626, Cl. 430-380.000.
Bajek, Walter A., to UOP Inc. Particle excluding sample probe. 4,481,833, Cl. 73-863.210.
Baker, Ray W.; Pawlak, Donald A.; and Ramey, Alford J., to United States of America, Energy. All metal valve structure for gas systems. 4,482,129, Cl. 251-334.000.
Balaceanu, Mihai: *See*—
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, 4,482,376, Cl. 75-10.00R.
Baldwin, Jeffrey D., to Sundstrand Corporation. Axially and radially compact full wave rectifier assembly for an alternator. 4,482,827, Cl. 310-68.00D.
Ball Corporation: *See*—
Reinker, Richard P.; Poyer, Myron E.; and Lester, James M., 4,481,778, Cl. 62-45.000.
Ball, Robert S.: *See*—
Guy, Fredrick A.; and Ball, Robert S., 4,481,722, Cl. 34-47.000.
Ball, Russell M.; and Womack, Edgar A., Jr., to Babcock & Wilcox Company, The. Subcooling margin system for cooling fluid in a nuclear reactor. 4,482,519, Cl. 376-216.000.
Ballard, Roy E.; and McKillop, Alexander, to National Research Development Corporation. Method of performing a chemical reaction. 4,482,438, Cl. 204-78.000.
Ballarini, Gaspare. Tool profile grinding machine, with mechanical adjustment of the grinding wheel and positioning of the tool interrelated. 4,481,740, Cl. 51-100.00R.
Bandyopadhyay, Gautam; and Galvin, Thomas M., to United States of America, Energy. Method of preparing nuclear wastes for tansportation and interim storage. 4,482,481, Cl. 252-628.000.
Banno, Kazuo; Fujioka, Takafumi; Oshiro, Yasuo; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Carbostyril derivatives, and antihistaminic agents containing the same. 4,482,560, Cl. 424-258.000.
Bar-Cohen, Yoseph; Stubbs, David A.; and Hoppe, Wally C., to Systems Research Laboratories, Inc. Multiphase backing materials for piezoelectric broadband transducers. 4,482,835, Cl. 310-327.000.
Barbee, Robert B.; Bass, Roy K.; and Davis, Burns, to Eastman Kodak Company. Polyamide containers having improved gas barrier properties. 4,482,695, Cl. 528-208.000.
Barcus-Berry, Inc.: *See*—
Crooks, Robert C., 4,482,866, Cl. 330-149.000.
Bardos, Andrew M.: *See*—
Bailey, David C.; Burberry, Lee M.; Trimble, Donald E.; Bardos, Andrew M.; and Perry, Philip M., 4,482,902, Cl. 346-108.000.
Barker, Anthony T.: *See*—
Richardson, Robert; and Barker, Anthony T., 4,482,816, Cl. 307-106.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Oberstrass, Detley, 4,481,762, Cl. 57-80.000.
Barnes, Ramon M.: *See*—
Meyer, Gerhard A.; and Barnes, Ramon M., 4,482,246, Cl. 356-316.000.
Barry, Patrick E., to Grumman Aerospace Corporation. Boolean filtering method and apparatus. 4,482,970, Cl. 364-517.000.
Bart, John J., Jr., to General Motors Corporation. Seat belt retractor. 4,482,101, Cl. 242-107.000.
Barth, Tomislav: *See*—
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.
Barthel, Alfred, to Union Carbide Corporation. Cryogenic storage container. 4,481,779, Cl. 62-48.000.
Barthell, Barry L.: *See*—
Duchane, David V.; and Barthell, Barry L., 4,481,999, Cl. 164-6.000.
Barthomeuf, Denise M.: *See*—
Rosenfeld, Daniel D.; and Barthomeuf, Denise M., 4,482,776, Cl. 585-828.000.
Bartley, Gary L.: *See*—
Rudich, George, Jr.; Beeson, Charles F.; and Bartley, Gary L., 4,482,847, Cl. 318-9.000.
BASF Aktiengesellschaft: *See*—
Hambrecht, Juergen; Reffert, Rudi W.; Muench, Volker; Echte, Adolf; and Swoboda, Johann, 4,482,705, Cl. 528-486.000.
Herrmann, Guenter; Frommer, Elmar; Paetsch, Juergen; Reiss, Wolfgang; and Winderl, Siegfried, 4,482,764, Cl. 568-864.000.
Kiefer, Hans, 4,482,492, Cl. 260-396.00K.
Merger, Franz; Nestler, Gerhard; Platz, Rolf; Towae, Friedrich; and Hellbach, Hans, 4,482,499, Cl. 260-453.00P.
Schuster, Hans H.; Dreher, Hermann; and Hambrecht, Juergen, 4,482,696, Cl. 528-212.000.
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BASF Farben & Fasern AG: *See*—
Blum, Rainer; Lehner, August; and Rubbert, Bernhard, 4,482,664, Cl. 524-212.000.
Vock, Friedrich; Lessmeister, Peter; and Kirchner, Ralf, 4,482,658, Cl. 523-348.000.
BASF Farben & Fasern A.G.: *See*—
Streitberger, Hans-Joachim; Lessmeister, Peter; and Zdahl, Norbert, 4,482,446, Cl. 204-181.00C.
BASF Wyandotte Corporation: *See*—
Reichel, Curtis J.; Patton, John T., Jr.; and Narayan, Thirumurti, 4,482,651, Cl. 521-115.000.
Bashark, Larry T., to Whirlpool Corporation. Electronic control for a domestic appliance. 4,481,786, Cl. 62-160.000.
Basley, Richard J.: *See*—
Osborn, Donald H.; and Basley, Richard J., 4,482,374, Cl. 75-0.50R.
Bass, Roy K.: *See*—
Barbee, Robert B.; Bass, Roy K.; and Davis, Burns, 4,482,695, Cl. 528-208.000.
Battelle Development Corporation: *See*—
Nguyen, Van T.; Bellmann, Gunter; and Armanet, Jean-Michel, 4,482,656, Cl. 523-212.000.
Battey, James F., to Psi Star, Inc. Liquid etching reactor and method. 4,482,425, Cl. 156-637.000.
Baudisch, Hans-Dieter; and Lippoldt, Roland, to VEB Kombinat Medizin- und Labortechnik Leipzig. Reducing socket for receptacle carriers of laboratory centrifuges for accommodations of test tubes or test vessels. 4,482,522, Cl. 422-104.000.
Bauer, Daniel P.; Beck, Jean-Paul H.; and Grognet, Jean-Claude J., to L'Oreal. Method for setting hair and a device for carrying out the said method. 4,481,961, Cl. 132-7.000.
Bauer, Walter; Farber, Heinrich; and Schneider, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Arrangement for introduction of a film magazine in a film-processing unit. 4,482,233, Cl. 354-312.000.
Bauman, Spencer S.; and Edwards, Dean L., to White-Sundstrand Machine Tool Co. Pallet changing system for a machining center. 4,482,043, Cl. 198-339.000.

Bausch & Lomb Incorporated: *See*—
Clark, James A., 4,482,221, Cl. 350-530.000.

Bawel, Fred, to Arkla Industries, Inc. Flue pipe connection. 4,481,935, Cl. 126-307.00R.

Baxter Travenol Laboratories, Inc.: *See*—
Bilstad, Arnold C.; and Foley, John T., 4,481,827, Cl. 73-861.000.

Bayer Aktiengesellschaft: *See*—
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert, 4,482,736, Cl. 560-255.000.
Freitag, Dieter; Hucks, Uwe; and Meissner, Hans-Jurgen, 4,482,694, Cl. 528-176.000.
Fuchs, Rainer; and Stendel, Wilhelm, 4,482,731, Cl. 560-08.000.
Hetzel, Hartmut; Gupta, Pramod; Nast, Roland; Echterhof, Herbert; and Brocker, Ulrich, 4,482,750, Cl. 568-621.000.
Kuhle, Engelbert; and Hagemann, Hermann, 4,482,737, Cl. 560-115.000.
Musch, Rudiger; Gobel, Wilhelm; Muller, Eberhard; and Konter, Wolfgang, 4,482,676, Cl. 525-215.000.
Neuray, Dieter; Nouvertne, Werner; Binsack, Rudolf; Rempel, Dieter; and Muller, Peter R., 4,482,672, Cl. 525-67.000.
Pellicelli, Bruno, 4,482,602, Cl. 428-245.000.
Serini, Volker; Mayska, Paul J.; Block, Hans-Dieter; and Freitag, Dieter, 4,482,693, Cl. 528-167.000.
Wegner, Christian; Muller, Hanns-Peter; and Kreuder, Hans J., 4,482,721, Cl. 548-262.000.

Bayer, Eberhard, to Siemens Aktiengesellschaft. X-Ray electro-photographic recording material and method for generating an electrical charge image in such material. 4,482,619, Cl. 430-84.000.

Beal, David D., to AT&T Bell Laboratories. Fast parity checking in cache tag memory. 4,483,003, Cl. 371-51.000.

Bearl, Leslie K.: *See*—
Wagner, Walter R.; and Bearl, Leslie K., 4,482,086, Cl. 277-12.000.

Beauregard, Louis G.: *See*—
Porche, Michael N.; and Beauregard, Louis G., 4,482,857, Cl. 323-205.000.

Becht, Reimund; and Bohm, Peter, to ITT Industries, Inc. Vacuum brake booster. 4,481,865, Cl. 91-369.00A.

Bechtel International Corporation: *See*—
Stone, Alan M., 4,482,097, Cl. 241-101.200.

Bechtel, Wolf D.: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,482,559, Cl. 424-256.000.

Beck, Bernice M.: *See*—
Beck, Michel D., 4,482,083, Cl. 222-500.000.

Beck, Jean-Paul H.: *See*—
Bauer, Daniel P.; Beck, Jean-Paul H.; and Grognet, Jean-Claude J., 4,481,961, Cl. 132-7.000.

Beck, John L.; Bornhorst, Randy J.; Smith, Donald J.; and Zell, Michael N., to International Business Machines Corporation. Magnetic recording disk cartridge. 4,482,929, Cl. 360-133.000.

Beck, Michel D., to Beck, Bernice M. Coffee saver. 4,482,083, Cl. 222-500.000.

Beck, Siegfried; Holfelder, Jurgen; Straub, Steffen; and Schnaker, Aloys, to Robert Bosch GmbH. Dual circuit brake valve. 4,482,191, Cl. 303-52.000.

Becton Dickinson and Company: *See*—
Burns, James A., 4,481,987, Cl. 141-12.000.

Beeson, Charles F.: *See*—
Rudich, George, Jr.; Beeson, Charles F.; and Bartley, Gary L., 4,482,847, Cl. 318-9.000.

Beisabarth, Osmond. Wheel alignment measuring apparatus. 4,481,716, Cl. 33-203.180.

Bellmann, Gunter: *See*—
Nguyen, Van T.; Bellmann, Gunter; and Armanet, Jean-Michel, 4,482,656, Cl. 523-212.000.

Ben Clements & Sons, Inc.: *See*—
Furutsu, Akira, 4,482,087, Cl. 227-67.000.

Benaroya, Henry. Gas turbine power production unit including a free piston gas generator. 4,481,772, Cl. 60-595.000.

Benneyan, Gregoire: *See*—
Wolf, Franz-Josef; Pletsch, Hubert; and Benneyan, Gregoire, 4,482,136, Cl. 267-152.000.

Benstead, Alan J.: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,481,872, Cl. 99-353.000.

Benton, Kenneth C.: *See*—
Desmond, Michael J.; Benton, Kenneth C.; and Weinert, Raymond J., 4,482,639, Cl. 502-117.000.

Berg, William C., to Control Data Corporation. Board to board interconnect structure. 4,482,937, Cl. 361-413.000.

Bergmann, Ewald: *See*—
Schneider, Franz; Bergmann, Ewald; and Gering, Gerhard, 4,481,847, Cl. 83-530.000.

Bergmans, Charles, to Clarks of England, Inc. Moccasin. 4,481,725, Cl. 36-11.000.

Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., to Berke, Joseph J. Computer terminal support and hand rest. 4,482,063, Cl. 211-69.100.

Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., to Berke, Joseph J. Computer terminal support and hand rest. 4,482,064, Cl. 211-69.100.

Bernard Matthews Limited: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,481,872, Cl. 99-353.000.

Bernauer, Karl; Link, Helmut; and Stohler, Harro, to Hoffmann-La Roche Inc. Carbamoyl alkylene phenyl ureas. 4,482,739, Cl. 564-54.000.

Bernhard Forster GmbH: *See*—
Forster, Rolf, 4,482,318, Cl. 433-7.000.

Berstein, Patricio; and Stephens, Walter R., to Exxon Research and Engineering Co. Fluid register system. 4,482,964, Cl. 364-465.000.

Berta, Dominic A.; and Kyllingstad, Vernon L., to Hercules Incorporated. Crosslinking halogen-containing polymers. 4,482,681, Cl. 525-349.000.

Bertolacini, Ralph J.: *See*—
Sorrentino, Cecelia M.; Pellet, Regis J.; and Bertolacini, Ralph J., 4,482,449, Cl. 208-139.000.

Bertram, James L.; Davis, William; and Walker, Louis L., to Dow Chemical Company, The. Epoxy resin compositions. 4,482,692, Cl. 528-93.000.

Besek, John B., Jr. Feeding bottle holder. 4,482,117, Cl. 248-103.000.

Beskin, Gerald S. Dressing device. 4,482,084, Cl. 223-111.000.

Besomi, Paul R.; Nelson, Ronald J.; and Wilson, Randall B., to AT&T Bell Laboratories. Protection of semiconductor substrates during epitaxial growth processes. 4,482,423, Cl. 156-622.000.

Bessette, Jeffrey R.: *See*—
Bacon, Duane E.; Bessette, Jeffrey R.; and Kohl, Paul A., 4,482,443, Cl. 204-129.300.

Betzing, Hans: *See*—
Biedermann, Juergen; and Betzing, Hans, 4,482,474, Cl. 252-311.000.

Beveridge, John. Stored energy power generating system. 4,481,775, Cl. 60-649.000.

Beyerlein, Robert A.; Jacobson, Allan J.; and Poeppelmeier, Kenneth R., to Exxon Research & Engineering Co. Oxygen-deficient, barium-containing perovskites. 4,482,644, Cl. 502-303.000.

Bhagwat, Pradeep M., to Canadian Patents and Development Limited. Hybrid inverter. 4,482,946, Cl. 363-136.000.

Bhattacharya, Bani K.: *See*—
Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., 4,482,556, Cl. 424-251.000.

Bhavsar, Manubhai R., to Reuland Electric Company. Composite control for soft start and dynamic braking of a three-phase induction motor. 4,482,853, Cl. 318-778.000.

Biber, Wolfgang; Stahle, Werner; and Stolz, Albert, to Daimler-Benz Aktiengesellschaft. Heating and air-conditioning installation for motor vehicles. 4,482,092, Cl. 237-12.30B.

Biedermann, Juergen; and Betzing, Hans, to A. Nattermann & Cie GMBH. Phospholipid solutions. 4,482,474, Cl. 252-311.000.

Bierhoff, Martinus P. M., to U.S. Philips Corporation. Apparatus for optically scanning a disc-shaped record carrier. 4,482,989, Cl. 369-46.000.

Bieringer, Hermann: *See*—
Handte, Reinhard; Matterstock, Karl; Bieringer, Hermann; and Kocher, Helmut, 4,482,373, Cl. 71-88.000.

Bilek, Frank V.; and Buell, David N., to United States of America, Air Force. Deployable folded antenna apparatus. 4,482,900, Cl. 343-915.000.

Bilstad, Arnold C.; and Foley, John T., to Baxter Travenol Laboratories, Inc. Blood fractionation apparatus having collection rate display system. 4,481,827, Cl. 73-861.000.

Binsack, Rudolf: *See*—
Neuray, Dieter; Nouvertne, Werner; Binsack, Rudolf; Rempel, Dieter; and Muller, Peter R., 4,482,672, Cl. 525-67.000.

Binz, Reiner; Knorpp, Eberhard; and von Sichart, Frithjof, to Siemens Aktiengesellschaft. Time division multiplex switching network unit. 4,482,995, Cl. 370-59.000.

Bio Mabuchi Co., Ltd.: *See*—
Mabuchi, Kenichi, 4,481,939, Cl. 128-57.000.

Biomat, Inc.: *See*—
Blicher, Steen, 4,481,907, Cl. 119-51.00R.

BioResearch Inc.: *See*—
Kurtz, Robert J.; and LiCausi, Joseph, 4,481,940, Cl. 128-80.00A.

Birchall, James D.: *See*—
Palgrave, Derek A.; Waite, Frederick A.; Birchall, James D.; Cooper, John; and Enever, James A., 4,482,372, Cl. 71-35.000.

Birkenbach, Alfred: *See*—
Burgdorf, Jochen; and Birkenbach, Alfred, 4,482,190, Cl. 303-6.00R.

Bishop, Carl D. Pneumatic winch. 4,482,133, Cl. 254-291.000.

Bjorkholm, Paul J., to American Science and Engineering, Inc. Use of a square root amplifier for statistics limited data. 4,482,957, Cl. 364-414.000.

Bjorkman, Ake: *See*—
Sikander, Ake; Bjorkman, Ake; and Jonsson, Gunther, 4,481,889, Cl. 110-212.000.

Blackburn, Anthony; and Readhead, John B., to U.S. Philips Corporation. Imaging devices and systems. 4,482,807, Cl. 250-334.000.

Blaisdell, Ronald G.; Hough, Harold L.; and Martenson, Richard B., to GTE Products Corporation. Projection unit including glass reflector with insulative cap member. 4,482,942, Cl. 362-293.000.

Blank, Izhak, to Forest Laboratories, Inc. Nitroglycerin preparations. 4,482,534, Cl. 424-28.000.

Blasnik, William, to Morrison, Thomas R. Gearshift indicator with range adjustment. 4,481,901, Cl. 116-28.100.

Blauhut, Reinhold: *See*—
Stwiorok, Andreas; Stojek, Dieter; Blauhut, Reinhold; Brandner, Burkhard; and Knuefelmann, Manfred, 4,481,912, Cl. 123-90.150.

Blazek, Henry, to Perkin-Elmer Corporation, The. World wide currency inspection. 4,482,971, Cl. 364-552.000.

Blicher, Steen, to Biomat, Inc. Method and apparatus for feeding animals. 4,481,907, Cl. 119-51.00R.

Bloch, Jerome F.: *See*—
Strandberg, Stanley L.; and Bloch, Jerome F., 4,481,998, Cl. 160-344.000.

Block, Hans-Dieter: *See*—
Serini, Volker; Mayska, Paul J.; Block, Hans-Dieter; and Freitag, Dieter, 4,482,693, Cl. 528-167.000.

Blodgett, Norman S., to Brown, James M. Container for static-sensitive articles. 4,482,048, Cl. 206-328.000.

Blue Harbor, Inc.: *See*—
Rutten, Peter T.; and Kalinowski, James E., 4,481,900, Cl. 114-311.000.

Blum, Rainer; Lehner, August; and Rubbert, Bernhard, to BASF Farben & Fasern AG. Dispersions of finely divided synthetic resins in plasticizers. 4,482,664, Cl. 524-212.000.

Blyler, Lee L., Jr.; and DiMarcello, Frank V., to AT&T Bell Laboratories. Ultraviolet absorbers in optical fiber coatings. 4,482,204, Cl. 350-96.340.

Bobsin, John H.; and Marouf, Mohamed A., to AT&T Bell Laboratories. Arrangement for reducing clipping in a digital conference arrangement. 4,482,997, Cl. 370-62.000.

BOC Group, Inc., The: *See*—
Mukerjee, Ajit K., 4,481,782, Cl. 62-63.000.

Bochis, Richard J.; and Dewey, Ray S., to Merck & Co., Inc. Isoefrotomycin, process of preparation, pharmaceutical composition and method of using same. 4,482,545, Cl. 424-181.000.

Boda, James, to Brunswick Corporation. Dampener for vane steering of marine drive. 4,482,331, Cl. 440-51.000.

Boeckman, Paul A.; and Young, Dennis L., to Dover Corporation. High pressure cam seal valve. 4,482,128, Cl. 251-163.000.

Boehringer Ingelheim KG: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,482,559, Cl. 424-256.000.

Boeing Company, The: *See*—
Fjelstad, Joseph C., 4,482,445, Cl. 204-129.430.
Gupta, Alankar; and Waters, Kenneth L., 4,482,114, Cl. 244-134.00B.
Kilner, Jerome R.; and Warren, Steven M., 4,482,961, Cl. 364-428.000.
McDermott, Arthur W., 4,481,709, Cl. 29-611.000.
Mitchell, John D., 4,481,702, Cl. 29-432.000.
Sutton, Richard C., 4,482,108, Cl. 244-12.400.

Boeke, Paul J.: *See*—
Leland, John E.; and Boeke, Paul J., 4,482,668, Cl. 524-413.000.

Boggs, Roger L.; and Tonsor, Andrew J., to Caterpillar Tractor Co. Roadable track assembly. 4,482,193, Cl. 305-51.000.

Bohannon, William D., Jr.; and Hamilton, Alfred S., to AT&T Technologies, Inc. Methods of and apparatus for forming strips of non-metallic and metallic material into tubular covers having overlapped seams. 4,482,413, Cl. 156-54.000.

Bohm, Peter: *See*—
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Boke-Kuhn, Karin: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,482,559, Cl. 424-256.000.

Bokil, Delip R.; and Narasimhan, Tanjore R., to Analog Devices, Inc. Reduced internal temperature technique for hermetic sealing of enclosures. 4,481,708, Cl. 29-588.000.

Bokori, Jozsef: *See*—
Pais, Istvan; Feher nee Ravasz, Magda; Nagy, Balint; Bokori, Jozsef; and Szabo, Zoltan, 4,482,550, Cl. 424-245.000.

Bolton-Emerson, Inc.: *See*—
Danforth, Donald W., 4,482,095, Cl. 241-46.110.

Bon, Charles K., to Dow Chemical Company, The. Use of H_2SO_4 H_3PO_4 to remove electrolytic deposits from silver cathode surfaces. 4,482,436, Cl. 204-73.00R.

Bongard, Michel: *See*—
Moyroud, Louis M.; Bongard, Michel; Vernez, Paul A.; and Moulin, Michel, 4,482,225, Cl. 354-5.000.

Boor, Anna; Toth, Jozsef; Szen, Tamas; Gabor, Laszlo; Major nee Feistner, Piroska; and Holly, Sandor, to Richter Gedeon Vegyeszeti Gyar R.T. Process for preparing 17α-hydroxy-pregn-4-en-3,20-dione. 4,482,494, Cl. 260-397.400.

Boot, Jacobus; Rozendaal, Adrianus; and Schijf, Robert, to Lever Brothers Company. Method for treating an edible oil by isothermal directed interesterification. 4,482,576, Cl. 426-603.000.

Booth, Frank B., to Celanese Corporation. Hydrocarbonylation. 4,482,748, Cl. 568-454.000.

Bopp & Reuther GmbH: *See*—
Schmitt, Manfred; and Zitzelsberger, Emil, 4,481,974, Cl. 137-514.000.

Borden, Inc.: *See*—
Williams, James H., 4,482,699, Cl. 528-260.000.

Borgwardt, Christian: *See*—
Luder, Ernst; Kallfass, Traugott; and Borgwardt, Christian, 4,482,882, Cl. 338-34.000.

Bornhorst, Randy J.: *See*—
Beck, John L.; Bornhorst, Randy J.; Smith, Donald J.; and Zell, Michael N., 4,482,929, Cl. 360-133.000.

Borsanyi, Alexander S., to American Hospital Supply Corporation. Peristaltic fluid-pumping apparatus. 4,482,347, Cl. 604-153.000.

Bosch-Siemens Hausgeraete GmbH: *See*—
Schweig, Dieter, 4,482,800, Cl. 219-446.000.

Bouladon, Gabriel; and Grisel, Lucien. Polishing machines incorporating rotating plate. 4,481,741, Cl. 51-131.100.

Bouley, Robert W.; and Kovar, Robert F., to Syncom International, Inc. Deep water flotation devices. 4,482,590, Cl. 428-35.000.

Bousquet, Hubert; Egraz, Jean Bernard; and Ravet, Georges, to Amax Inc.; and Printex. Isodiametrical microcapsules with regularized diameters and process for producing same. 4,482,606, Cl. 428-402.200.

Bowen, Christopher T.; Davis, H. John; and LeRoy, Rodney L., to Noranda Inc.; and Electrolyser Corporation Ltd., The. Electrode structure for electrolyser cells. 4,482,448, Cl. 204-284.000.

Bowman, Jeffery B.; Hubis, Daniel E.; Lewis, James D.; Newman, Stephen C.; and Staley, Richard A., to W. L. Gore & Associates, Inc. Process for producing a high strength porous polytetrafluoroethylene product having a coarse microstructure. 4,482,516, Cl. 264-127.000.

Boyce, Pamela J.: *See*—
Willis, Stephen B.; and Boyce, Pamela J., 4,482,667, Cl. 523-400.000.

Boyle, Daniel J., to Champion International Corporation. Integral carton blank for a carton with four cells and carton. 4,482,055, Cl. 206-606.000.

Bozung, Richard E. Zither-like instruments. 4,481,855, Cl. 84-173.000.

Bozzelli, John W.; Dennis, Kent S.; and Donate, Felipe A., to Dow Chemical Company, The. Anionic polymerization of cis- and trans-1,3-pentadiene from a mixture of saturated and unsaturated hydrocarbons. 4,482,771, Cl. 585-10.000.

Bradley, C. Earl: *See*—
Goshorn, Lawrence A.; and Bradley, C. Earl, 4,481,768, Cl. 60-327.000.

Bradshaw, John: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; Hayes, Norman F.; Bradshaw, John; Carter, Malcolm; and Wadsworth, Alan, 4,482,549, Cl. 424-244.000.

Bradshaw, John L.: *See*—
Hampel, Daniel; and Bradshaw, John L., 4,483,017, Cl. 382-17.000.

Brady, David A. Apparatus and method for training a person to pour predetermined quantities of liquids into containers. 4,482,327, Cl. 434-219.000.

Brady, Thomas E., Jr., to Owens-Illinois, Inc. Methods for reducing post-mold shrinkage of hollow oriented polyethylene terephthalate containers. 4,482,518, Cl. 264-535.000.

Brag Systems Canada Ltd.: *See*—
Anderson, Raymond, 4,481,966, Cl. 137-59.000.

Brandenstein, Manfred; and Hans, Rudiger, to SKF Kugellagerfabriken GmbH. Hydraulic release arrangement for vehicle clutches. 4,482,040, Cl. 192-88.00A.

Brandentein, Manfred: *See*—
Walter, Lothar; Brandentein, Manfred; Ernst, Horst M.; and Olschewski, Armin, 4,482,338, Cl. 464-167.000.

Brandherm, Rolf, to Wasifalische Metall Industrie KG Hueck & Co. Interior lighting with a rotary switch. 4,482,940, Cl. 362-74.000.

Brandi, Roberto; Bucaneve, Giovanni; Della Greca, Antonio; Sebastiani, Gaetano; Toffano, Francesco; and Vielmo, Paolo, to Tecnomare, S.p.A. Floating platform for use in deep waters, and method of installation. 4,482,274, Cl. 405-224.000.

Brandner, Burkhard: *See*—
Stwiorok, Andreas; Stojek, Dieter; Blauhut, Reinhold; Brandner, Burkhard; and Knuefelmann, Manfred, 4,481,912, Cl. 123-90.150.

Brattstrom, Leif; Mattsson, Kjell; and Arvidsson, Bertil, to Aktiebolaget Bofors. Hollow charge. 4,481,886, Cl. 102-476.000.

Breining, Tibor: *See*—
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,482,557, Cl. 424-251.000.

Brenn, Gary K., to Bron Electronics, Inc. Herbicide spreader. 4,481,894, Cl. 111-6.000.

Brennom, Stephen O.: *See*—
Pollock, Charles B.; Murzyn, Patrick J.; Brennom, Stephen O.; and Lambert, James N., 4,482,392, Cl. 134-7.000.

Bresson, Clarence R.; Parlman, Robert M.; and Robles, Benjamin R., to Phillips Petroleum Company. Polycarboxylic acid derivatives and uses. 4,482,480, Cl. 252-61.000.

Bridgestone Tire Co., Ltd.: *See*—
Ogawa, Masaki; Hirata, Yasushi; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,481,995, Cl. 152-356.00R.
Takigawa, Hiroyoshi; and Ogawa, Hiroshi, 4,481,992, Cl. 152-209.00R.
Yasukochi, Takashi; and Fukamachi, Yoshihiro, 4,482,416, Cl. 156-133.000.

Briggs, Stuart P.: *See*—
Twist, Peter J.; Bailey, Joseph; Briggs, Stuart P.; Mijovic, Miroslav V.; and Southby, David T., 4,482,626, Cl. 430-380.000.

Brightman, Barrie; Niertit, Frank; and Hartman, Joseph A., to Stromberg-Carlson. Bilateral electronic switch. 4,482,817, Cl. 307-257.000.

British-American Tobacco Company Limited: *See*—
Brooks, Geoffrey O., 4,481,960, Cl. 131-336.000.
Luke, John A.; and MacLean, Kenneth J. H., 4,481,954, Cl. 131-77.000.

British Ceramic Research Association Limited: *See*—
Airey, Anthony C.; and Spiller, Andrew, 4,482,390, Cl. 106-308.00B.

British Gas Corporation: *See*—
Prentice, Ian, 4,481,816, Cl. 73-432.00R.

British Nuclear Fuels Limited: *See*—
Loosemore, William R.; Watkins, Roger D.; and Desborough, Colin L., 4,481,811, Cl. 73-198.000.

Brobeck, Helmut; Ludewig, Hartmut; Miribel, Wolfgang; and Stonner, Helmut, to Aktiengesellschaft Kuhnle, Kopp & Kausch. Compressor

of a type incorporated in an exhaust gas turbocharger. 4,482,304, Cl. 417-407.000.

Brock Manufacturing, Inc.: *See*—
Dorn, James D., 4,482,278, Cl. 411-377.000.

Brocker, Ulrich: *See*—
Hetzel, Hartmut; Gupta, Pramod; Nast, Roland; Echterhof, Herbert; and Brocker, Ulrich, 4,482,750, Cl. 568-621.000.

Brodrene Gram A/S: *See*—
Gram, Hans, 4,482,341, Cl. 493-302.000.

Broekaert, Edwin: *See*—
DeCuyper, Jacques; Broekaert, Edwin; and Van't Hoff, Joris, 4,482,454, Cl. 209-166.000.

Bromley, James E.; and Dees, John R., to Celanese Corporation. Desensitized spinneret. 4,482,309, Cl. 425-131.500.

Bron Electronics, Inc.: *See*—
Brenn, Gary K., 4,481,894, Cl. 111-6.000.

Brookes, John W.: *See*—
Martin, Reginald, deceased; White, Winifred, legal representative; Edwards, Nora, legal representative; Brookes, John W.; and Reeve, Thomas S., 4,482,364, Cl. 55-158.000.

Brookman, Larry W. Safety mirror. 4,482,210, Cl. 350-631.000.

Brooks, Geoffrey O., to British-American Tobacco Company Limited. Cigarettes. 4,481,960, Cl. 131-336.000.

Brooks, John S.: *See*—
Karau, Philip A.; Littrell, Marshall W.; and Brooks, John S., 4,481,925, Cl. 123-425.000.

Brost, Dale F.: *See*—
Davis, Lorne A., Jr.; Brost, Dale F.; and Haskin, Helen K., 4,482,634, Cl. 436-31.000.

Brown, Daniel P., to Motorola, Inc. Narrow band television transmission system. 4,483,011, Cl. 375-25.000.

Brown, George L.; de Sorgo, Miksa; and Spencer, Arthur T., to SCM Corporation. Aqueous coating composition comprising self-emulsifiable ester of epoxy and acid containing addition polymer and method of its preparation. 4,482,673, Cl. 525-119.000.

Brown, James M.: *See*—
Blodgett, Norman S., 4,482,048, Cl. 206-328.000.

Brown, Robert E., to Caterpillar Tractor Co. Reversible pump coupling apparatus. 4,482,300, Cl. 417-239.000.

Brownstein, Scott A., to Eastman Kodak Company. Video player, film medium, and photographic printer for automatic cropping. 4,482,924, Cl. 358-302.000.

Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, to Ceskoslovenska akademie ved. Analogs of vasopressin. 4,482,486, Cl. 260-112.50R.

Bruder, Stephen; Higby, Philip; and Roth, Edgar, to Heydenreich, Lee. Apparatus and method for weighing fluent material. 4,481,985, Cl. 141-1.000.

Bruner, Frank D. Fuel mixing apparatus. 4,481,931, Cl. 123-557.000.

Brunswick Corporation: *See*—
Boda, James, 4,482,331, Cl. 440-51.000.
Sheaffer, Benjamin L., 4,481,910, Cl. 123-73.00R.
Sheaffer, Benjamin L.; and Griffiths, John M., 4,481,911, Cl. 123-73.00R.

BS&B Safety Systems, Inc.: *See*—
Allen, Jerome D., 4,481,850, Cl. 83-879.000.

Bucaneve, Giovanni: *See*—
Brandi, Roberto; Bucaneve, Giovanni; Della Greca, Antonio; Sebastiani, Gaetano; Toffano, Francesco; and Vielmo, Paolo, 4,482,274, Cl. 405-224.000.

Bucaro, Joseph A.: *See*—
Lagakos, Nicholas; and Bucaro, Joseph A., 4,482,205, Cl. 350-96.340.

Buckley, B. Shawn: *See*—
Buckley, Bruce S., 4,481,975, Cl. 137-561.00A.

Buckley, Bruce S., to Buckley, B. Shawn. Multi-sheet corrugated tank construction for passive solar heating systems. 4,481,975, Cl. 137-561.00A.

Bucur, Grigore: *See*—
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, 4,482,376, Cl. 75-10.00R.

Budd Company, The: *See*—
Horlebaus, Richard P.; and Kiser, Herbert H., 4,482,798, Cl. 219-137.710.

Buell, David N.: *See*—
Bilek, Frank V.; and Buell, David N., 4,482,900, Cl. 343-915.000.

Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, to Buhler, Eugen, enbach; and Hutschenreuther AG. Method of and apparatus for producing molded articles from pourable compounds. 4,482,515, Cl. 264-102.000.

Bulanda, John J.: *See*—
Caveney, Jack E.; Moody, Roy A.; and Bulanda, John J., 4,481,710, Cl. 29-749.000.

Bulten, Eric J.; and Verbeek, Francois, to Nederlandse Centrale Organisatie Voor Toegepastnatuurweten-Schappelijk Onderzoek. Platinum (IV)-diamine complexes, a process for the preparation of pharmaceutical compositions and a method of treating malignant tumors in mice. 4,482,569, Cl. 424-287.000.

Bunce, Roger A.; and Studer, Rolf O., to Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The. Support means. 4,482,521, Cl. 422-102.000.

Bundgaard, Hans: *See*—
Thorbek, Pia; Bundgaard, Hans; and Larsen, Claus, 4,482,722, Cl. 548-338.000.

Bunker, James E., to Minnesota Mining and Manufacturing Company. Olefinic esters of phosphorus chlorides and bromides. 4,482,505, Cl. 260-952.000.

Bunnell, J. Bert, to Bunnell Life Systems, Inc. Apparatus and method for assisting respiration. 4,481,944, Cl. 128-204.180.

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Bunnell, J. Bert, 4,481,944, Cl. 128-204.180.

Bunton Company: *See*—
Tsuchiya, Katsumi, 4,481,757, Cl. 56-16.900.

Burberry, Lee M.: *See*—
Bailey, David C.; Burberry, Lee M.; Trimble, Donald E.; Bardos, Andrew M.; and Perry, Philip M., 4,482,902, Cl. 346-108.000.

Burgdorf, Jochen; and Birkenbach, Alfred, to ITT Industries, Inc. Multiple-circuit hydraulic brake system. 4,482,190, Cl. 303-6.00R.

Burgeson, John E.; and Kruse, Gary S., to General Dynamics Corporation/Convair Div. Integrated conductor and coil structure for superconducting coils. 4,482,878, Cl. 335-216.000.

Burgess, Robert G., to Radiation Dynamics, Inc. Apparatus for guiding cable through a radiation chamber with reduced leakage therefrom. 4,482,811, Cl. 250-492.300.

Burke, Gary R., to Fairchild Camera & Instrument Corporation. Computer with console addressable PLA storing control microcode and microinstructions for self-test of internal registers and ALU. 4,482,953, Cl. 364-200.000.

Burke, Michael A.; and Andersson, Clarence A., to Westinghouse Electric Corp. Semiconductor device soldered to a graphite substrate. 4,482,913, Cl. 357-67.000.

Burlington Industries, Inc.: *See*—
Stousland, Olay, 4,482,594, Cl. 428-92.000.

Burns, Carmen D., to National Semiconductor Corporation. Stabilization of semiconductor device package leads. 4,482,781, Cl. 174-52.0FP.

Burns, James A., to Becton Dickinson and Company. Method for dispensing fine powders. 4,481,987, Cl. 141-12.000.

Burroughs Corporation: *See*—
Henderson, Donald L., Sr., 4,482,908, Cl. 357-23.600.
Wilson, Jesse R.; and Logsdon, Gary L., 4,482,996, Cl. 370-60.000.

Buss, Waldeen C.; and Hughes, Thomas R., to Chevron Research Company. In situ hydrocarbon conversion catalyst regeneration and sulfur decontamination of vessels communicating with catalyst reactor. 4,482,637, Cl. 502-37.000.

Buttinoni, Ada: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,482,555, Cl. 424-248.400.

Byrne, Stanley W., to American Filtrona Corporation, 8401. Filtering means. 4,481,959, Cl. 131-336.000.

C. K. Kelley & Sons, Inc.: *See*—
Kelley, Charles K.; and Jones, William W., 4,482,294, Cl. 415-219.00R.

Cabanaw, Boyd E., to Standard Oil Company (Indiana). System and process for producing elemental sulfur. 4,482,532, Cl. 423-574.00R.

Cachat, Francis J.: *See*—
Rapaport, Stanley; and Cachat, Francis J., 4,482,662, Cl. 523-504.000.

Cade, Phillip J., to Electronics Corporation of America. Burner control system. 4,482,312, Cl. 431-31.000.

Caffes, Peter J., to Caffes Trust (Irwin M. Aisenberg, Trustee), The. Apparatus for solid/liquid separation by vaporization and condensation. 4,482,432, Cl. 202-187.000.

Caffes Trust (Irwin M. Aisenberg, Trustee), The: *See*—
Caffes, Peter J., 4,482,432, Cl. 202-187.000.

Call, Kenneth R.: *See*—
Harju, Philip H.; and Call, Kenneth R., 4,482,643, Cl. 502-242.000.

Campbell, Joseph K. Pipe stress/strain neutralizers. 4,482,171, Cl. 285-95.000.

Camplin, Harry R.; and Golden, Patrick, to United States of America, Army. Pulse-type cleaning means for filter panels. 4,482,366, Cl. 55-273.000.

Canadian Fram Limited: *See*—
Mason, Murray R., 4,482,038, Cl. 192-48.200.

Canadian Patents and Development Limited: *See*—
Bhagwat, Pradeep M., 4,482,946, Cl. 363-136.000.

Canon Kabushiki Kaisha: *See*—
Hosono, Nagao; and Isaka, Kazuo, 4,482,239, Cl. 355-3.0FU.
Kuge, Tsukasa; Tanigawa, Koichi; and Adachi, Hiroyuki, 4,482,240, Cl. 355-3.0TR.
Sugiura, Yoji, 4,482,229, Cl. 354-212.000.
Suzuki, Koji; Kuroda, Kouki; and Nagahira, Jyoji, 4,482,243, Cl. 355-14.00D.
Tamamura, Hideo, 4,482,226, Cl. 354-173.100.
Tanaka, Kazuo, 4,482,218, Cl. 350-427.000.
Tokuda, Ryuji, 4,482,238, Cl. 354-427.000.
Tsuzuki, Hiroyoshi; Tokuda, Ryuji; and Matsuda, Mutsuhide, 4,482,236, Cl. 354-412.000.
Yuguchi, Naoki; and Kawasaki, Keiichi, 4,483,014, Cl. 378-173.000.

Cantello, Giuseppe, to Ing. C. Olivetti & C., S.p.A. Control circuit for stepping motor. 4,482,851, Cl. 318-696.000.

Cantey, Bryant W., Jr. Shipping pallet. 4,482,051, Cl. 206-392.000.

Canzek, Ludvik, to Kern & Co. AG. High speed catadioptric objective lens system. 4,482,219, Cl. 350-444.000.

Caplin, Peter B., to Energy Equipment Company Limited, The. Fluidized bed method and apparatus for producing a combustible gas. 4,482,359, Cl. 48-89.000.

Carbochimica Italiana S.p.A.: *See*—
Petrini, Valentino; and Preda, Stefano, 4,482,517, Cl. 264-143.000.
Carex Process AB: *See*—
Jacquet, Sten F., 4,482,457, Cl. 210-270.000.
Carl Walther GmbH: *See*—
Zanner, Georg; and Repa, Otto, 4,481,863, Cl. 89-138.000.
Carlsson, Bengt: *See*—
Lindahl, Lars; and Carlsson, Bengt, 4,482,089, Cl. 228-173.00C.
Carr, Jack, to Roseman Mower Corporation. Gang mower trailer. 4,481,755, Cl. 56-7.000.
Carr, Neil; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Raynes, Edward P., to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The. Liquid crystal materials. 4,482,472, Cl. 252-299.100.
Carr, Wallace B.: *See*—
Carr, William J.; and Carr, Wallace B., 4,481,920, Cl. 123-246.000.
Carr, William J.; and Carr, Wallace B., to PDT Development & Marketing. Rotary internal combustion engine, fluid motor and fluid pump having planetating gear pistons. 4,481,920, Cl. 123-246.000.
Carson, Don B.; and James, Robert B., Jr., to UOP Inc. Process for producing a hydrogen-rich gas stream from the effluent of a catalytic hydrocarbon conversion reaction zone. 4,482,369, Cl. 62-18.000.
Carter, Malcolm: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; Hayes, Norman F.; Bradshaw, John; Carter, Malcolm; and Wadsworth, Alan, 4,482,549, Cl. 424-244.000.
Carter, Mark A.: *See*—
Luebbe, Ray H., Jr.; and Carter, Mark A., 4,482,599, Cl. 428-212.000.
Cartwright, Winston G.; and Gater, Alan, to Darglen Engineering Limited. Safes. 4,481,888, Cl. 109-50.000.
Cascade Corporation: *See*—
Farmer, Stanley E.; and Seaberg, Richard D., 4,482,286, Cl. 414-607.000.
Casio Computer Co., Ltd.: *See*—
Ishikawa, Hiroyuki, 4,482,976, Cl. 364-710.000.
Caso Computer Co., Ltd.: *See*—
Ishikawa, Tomohisa, 4,481,853, Cl. 84-1.030.
Cassanelli, Robert: *See*—
Rodriguez, Jose ; and Cassanelli, Robert, 4,481,861, Cl. 89-41.00A.
Castonguay, Roger N.; and Jencks, Charles L., to General Electric Company. Electric circuit breakers having fast short circuit response. 4,482,877, Cl. 335-191.000.
Caterpillar Tractor Co.: *See*—
Boggs, Roger L.; and Tonsor, Andrew J., 4,482,193, Cl. 305-51.000.
Brown, Robert E., 4,482,300, Cl. 417-239.000.
Lohbauer, Kenneth R.; and Moots, Paul C., 4,481,770, Cl. 60-452.000.
Stevens, Wallace G., 4,481,837, Cl. 74-342.000.
Cates, Ronnie L., to Motorola, Inc. Unit for prioritizing earlier and later arriving input requests. 4,482,949, Cl. 364-200.000.
Caveney, Jack E.; Moody, Roy A.; and Bulanda, John J., to Panduit Corp. Tool for applying connectors. 4,481,710, Cl. 29-749.000.
Ceausescu, Nicu: *See*—
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, 4,482,376, Cl. 75-10.00R.
Ceca S.A.: *See*—
DeCuyper, Jacques; Broekaert, Edwin; and Van't Hoff, Joris, 4,482,454, Cl. 209-166.000.
Celanese Corporation: *See*—
Booth, Frank B., 4,482,748, Cl. 568-454.000.
Bromley, James E.; and Dees, John R., 4,482,309, Cl. 425-131.500.
Central Mine Equipment Company: *See*—
Rassieur, Charles L., 4,482,173, Cl. 285-330.000.
Centre National de la Recherche Scientific: *See*—
Alais, Pierre, 4,481,823, Cl. 73-626.000.
Ceskoslovenska akademie ved: *See*—
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.
Chadha, Vijay K.: *See*—
Plapp, Bryce V.; and Chadha, Vijay K., 4,482,568, Cl. 424-275.000.
Chadwick, Joseph D. Fuel inlet repair device. 4,481,930, Cl. 123-495.000.
Chakrawarti, Shekhar; Delancey, Warren; and Haydn, Michael, to R. W. Beckett Corporation. Automatic air inlet damper. 4,482,291, Cl. 415-25.000.
Chambers, Joseph W., Sr., to Disposable Waste Systems, Inc. Fluid pressure assisted rotary shaft seal with labyrinth bushing and replacement seal sleeve cartridge. 4,482,194, Cl. 384-480.000.
Chambertin Corporation: *See*—
Graham, John W., 4,481,688, Cl. 15-119.00A.
Champion International Corporation: *See*—
Boyle, Daniel J., 4,482,055, Cl. 206-606.000.
Dutcher, Daniel P., 4,482,056, Cl. 206-611.000.
Rutter, Christopher C.; and Hill, Gerald R., 4,481,753, Cl. 53-471.000.
Champlin, Cary R.: *See*—
King, Thomas M.; Champlin, Cary R.; and Daniel, Sam M., 4,482,975, Cl. 364-608.000.
Chamuel, Jacques R., to Charles Stark Draper Laboratory, Inc., The. Electro-elastic self-scanning crack detector. 4,481,821, Cl. 73-617.000.
Chan, Wan-Kit: *See*—
Huang, Fu-chih; Jones, Howard; and Chan, Wan-Kit, 4,482,544, Cl. 424-177.000.
Chan, Woontung G., to Philip Morris Incorporated. Smoking compositions. 4,481,956, Cl. 131-276.000.
Chandrasekaran, Swayambu: *See*—
Chin, Hong B.; and Chandrasekaran, Swayambu, 4,482,685, Cl. 526-91.000.
Chao, Chien C.; and Sherman, John D., to Union Carbide Corporation. Bulk separation of inositol and sorbitol by selective adsorption on zeolitic molecular sieves. 4,482,761, Cl. 568-833.000.
Chapin, Richard M. Article of furniture. 4,482,195, Cl. 312-210.000.
Charles of the Ritz Group Ltd.: *See*—
El-Menshawy, El-Sayed; and Dixon, Richard, 4,482,537, Cl. 424-59.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Chamuel, Jacques R., 4,481,821, Cl. 73-617.000.
Leehey, Jonathan R., 4,482,862, Cl. 324-117.00R.
Cheetham, Harry A., to Stelrad Group Limited. Gasburner system. 4,482,313, Cl. 431-89.000.
Chekroun, Isaac; and Heymes, Alain, to Sanofi. Process for the preparation of 2-(thien-2-yl)- and 2-(thien-3-yl)-ethylamine derivatives. 4,482,718, Cl. 546-284.000.
Chemical Research & Licensing Company: *See*—
Smith, Lawrence A., Jr., 4,482,775, Cl. 585-671.000.
Chemische Werke Huels AG: *See*—
Hofmann, Peter, 4,482,503, Cl. 260-465.200.
Seig, Reinhard, 4,482,758, Cl. 568-804.000.
Chempro Corporation: *See*—
Heins, Sidney M., 4,482,377, Cl. 75-101.00R.
Chen, Hao-Lin, to United States of America, Energy. Nitrogen fixation apparatus. 4,482,525, Cl. 422-186.000.
Chen, Michael S.; Edwards, James T.; and Ernst, William R., to Air Products and Chemicals, Inc. Catalytic hydrolysis of COS in acid gas removal solvents. 4,482,529, Cl. 423-243.000.
Cheng, Paul J., to Phillips Petroleum Company. Differential flow rate sensor. 4,481,828, Cl. 73-861.630.
Cheskis, Harvey P.: *See*—
Young, Kenneth P.; Tyler, Derek E.; Cheskis, Harvey P.; and Watson, W. Gary, 4,482,012, Cl. 165-146.000.
Chester, Arthur W.: *See*—
Chu, Yung F.; Smith, Fritz A.; and Chester, Arthur W., 4,482,773, Cl. 585-481.000.
Chester, Martin H. Endotracheal tube retractor. 4,481,947, Cl. 128-303.00R.
Chevron Research Company: *See*—
Buss, Waldeen C.; and Hughes, Thomas R., 4,482,637, Cl. 502-37.000.
Threlkel, Richard S., 4,482,735, Cl. 560-187.000.
Chiba, Akio; Shimizu, Seiki; Kuniya, Keiichi; and Onuki, Jin, to Hitachi, Ltd. Stacked structure having matrix-fibered composite layers and a metal layer. 4,482,912, Cl. 357-67.000.
Chicherin, Jury E.: *See*—
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; and Chicherin, Jury E., 4,482,950, Cl. 364-200.000.
Chin, Hong B.; and Chandrasekaran, Swayambu, to Allied Corporation. Copolymerization of ethylene and chlorotrifluoroethylene in an aqueous emulsion. 4,482,685, Cl. 526-91.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,482,557, Cl. 424-251.000.
Chisso Corporation: *See*—
Fujishita, Kusuo; Sakamoto, Hideshi; Yamazawa, Tomio; and Yamaguchi, Junichi, 4,482,595, Cl. 428-95.000.
Chouinard, Joseph R. C., to Atlantic Bridge Company Limited. Air lock valve for pneumatic conveying system. 4,482,276, Cl. 406-169.000.
Chow, Wing-Sun; Walton, Richard W.; and D'Stefan, Donna A., to E. R. Squibb & Sons, Inc. Automated control for a two-directional pump. 4,482,345, Cl. 604-31.000.
Chu, Yung F.; Smith, Fritz A.; and Chester, Arthur W., to Mobil Oil Corporation. Catalyst for xylene isomerization. 4,482,773, Cl. 585-481.000.
Churyo Engineering Co., Ltd.: *See*—
Akimoto, Ryosaku; and Ito, Nobuaki, 4,481,789, Cl. 62-209.000.
Ciba-Geigy AG: *See*—
Long, William E., 4,482,716, Cl. 546-211.000.
Ciba-Geigy Corporation: *See*—
Dubas, Henri; and Kirchmayr, Rudolf, 4,482,463, Cl. 252-47.500.
Irving, Edward, 4,482,679, Cl. 525-327.300.
Weber, Kurt, 4,482,496, Cl. 260-465.00E.
Cimochowski, Anthony E., to Manville Service Corporation. Mini-module and method of installing same to fill gaps between adjacent insulation modules. 4,481,746, Cl. 52-404.000.
Citizen Watch Co., Ltd.: *See*—
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,482,257, Cl. 368-88.000.
Hashimoto, Eigo; and Nanya, Takanori, 4,482,216, Cl. 350-357.000.
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,481,742, Cl. 51-165.800.
Clark, James A., to Bausch & Lomb Incorporated. Microscope fine focus control mechanism. 4,482,221, Cl. 350-530.000.

Clarks of England, Inc.: *See—*
Bergmans, Charles, 4,481,725, Cl. 36-11.000.
Clements, Thomas W.: *See—*
Fallon, Merton R.; and Clements, Thomas W., 4,481,969, Cl. 137-116.500.
Clevepost, Inc.: *See—*
Gardner, Roland C., 4,482,054, Cl. 206-594.000.
Clitherow, John W., to Glaxo Group Limited. Triazole compounds and their pharmaceutical use. 4,482,552, Cl. 424-246.000.
Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, to International Playtex, Inc. Method of fabricating two layer cups and brassiere. 4,481,951, Cl. 128-516.000.
Colgate-Palmolive Company: *See—*
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,471, Cl. 252-186.310.
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,477, Cl. 252-540.000.
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,630, Cl. 435-187.000.
Hayes, Harry; Morton, Anthony J.; and Harvey, Kenneth, 4,482,536, Cl. 424-52.000.
Witt, Edward, 4,482,675, Cl. 525-132.000.
Colin, Jean P., to Ateliers et Chantiers de Bretagne acb. Load transfer and monitoring system for use with jackup barges. 4,482,272, Cl. 405-198.000.
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; Hayes, Norman F.; Bradshaw, John; Carter, Malcolm; and Wadsworth, Alan, to Glaxo Group Limited. Aminocyclopentane esters and pharmaceutical formulation. 4,482,549, Cl. 424-244.000.
Collins, Floyd K.; and Say, Donald L., to North American Philips Consumer Electronics Corp. CRT Cathode assembly with support means. 4,482,840, Cl. 313-446.000.
Collins Industries, Inc.: *See—*
Robbins, Bobbie L.; and Norton, Gary L., 4,482,284, Cl. 414-539.000.
Combustion Engineering, Inc.: *See—*
Wentzell, Timothy H., 4,481,814, Cl. 73-432.00R.
Wentzell, Timothy H., 4,482,076, Cl. 220-232.000.
Commissariat a l'Energie Atomique: *See—*
Auchapt, Pierre; and Ferlay, Aime , 4,482,343, Cl. 494-56.000.
Lorin, Andre ; Rosilio, Andre ; and Tanguy, Jean, 4,482,581, Cl. 427-79.000.
Commonwealth of Australia: *See—*
Ludowyk, Christopher J.; and Gee, Stewart G. W., 4,481,817, Cl. 73-583.000.
Compagnie Generale des Etablissements Michelin: *See—*
Pommier, Jean, 4,481,994, Cl. 152-353.00R.
Concorde Battery Corporation: *See—*
Orsino, Joseph A.; Sawyer, Ernest R.; and Hollett, Ronald J., 4,482,618, Cl. 429-179.000.
Connolly, John F.; and Thrash, Robert J., to Standard Oil Company (Indiana). Controlling solubility of lithium salts in liquid sulfur dioxide. 4,482,616, Cl. 429-101.000.
Consolidated Controls Corporation: *See—*
Reinicke, Robert H., 4,482,346, Cl. 604-152.000.
Constant, Jennifer: *See—*
Carr, Neil; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Raynes, Edward P., 4,482,472, Cl. 252-299.100.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Pieper, Henner, 4,481,991, Cl. 152-209.00R.
Control Data Corporation: *See—*
Berg, William C., 4,482,937, Cl. 361-413.000.
Cook, Greg, to Cook Machine Company. Outboard motor mounting apparatus. 4,482,330, Cl. 440-2.000.
Cook Machine Company: *See—*
Cook, Greg, 4,482,330, Cl. 440-2.000.
Cooke, Larry, to Storage Technology Partners. Electron beam exposure system. 4,482,810, Cl. 250-492.200.
Cooley, Jack S., to Mead Corporation, The. Packaging apparatus and method. 4,481,750, Cl. 53-398.000.
Coombs, Daniel M.; and Willers, Gary P., to Phillips Petroleum Company. Supercritical extraction process. 4,482,453, Cl. 208-309.000.
Cooper, Alan B.: *See—*
Wright, John J.; and Cooper, Alan B., 4,482,564, Cl. 424-269.000.
Cooper, John: *See—*
Palgrave, Derek A.; Waite, Frederick A.; Birchall, James D.; Cooper, John; and Enever, James A., 4,482,372, Cl. 71-35.000.
Cooper, Robin D. G.; Graves, Bernard J.; and Lavagnino, Edward R., to Eli Lilly and Company. Benzothienylglycyl cephalosporin derivatives. 4,482,553, Cl. 424-246.000.
Copie, Fernand, to RayGo, Inc. Load carrier assembly. 4,482,285, Cl. 414-589.000.
Corbeil, Romain; Faubert, Jacques; and Trudeau, Marcel, to Hydro Quebec. Support device for a fire extinguisher. 4,482,123, Cl. 248-542.000.
Corboy, John F., Jr.: *See—*
McGinn, Joseph T.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,482,422, Cl. 156-612.000.
Corda, Francesco: *See—*
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; and Logoni, Angelo, 4,482,570, Cl. 424-304.000.
Cordis Corporation: *See—*
Gold, Philip; and Tarjan, Peter P., 4,481,953, Cl. 128-786.000.
Cordon, William A. Method and apparatus for storing energy. 4,482,010, Cl. 165-53.000.
Cordova Chemical Company of Michigan: *See—*
Spitz, Rodney D.; and Valk, Donald R., 4,482,381, Cl. 106-90.000.
Cornell Research Foundation, Inc.: *See—*
Ingraffea, Anthony R., 4,481,826, Cl. 73-799.000.
Corning Glass Works: *See—*
Lock, William E., 4,481,879, Cl. 101-39.000.
Cousens, Donald E.: *See—*
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,482,794, Cl. 219-56.220.
Couture, Paul A.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,481,735, Cl. 49-325.000.
Cowie, William P.; Lawrence, Drummond M. P.; and Goodlad, Morgan H., to Internationale Octrooi Maatschappij "Octropa" B.V. Method and apparatus for treating fish carcasses for separating flesh from frames and skins. 4,481,693, Cl. 17-46.000.
Crauwels, Guy L., to International Business Machines Corporation. Integrated weighted current digital to analog converter. 4,482,887, Cl. 340-347.0DA.
Crawford, Jeffrey D.: *See—*
Zelkowitz, Hyman L.; Crawford, Jeffrey D.; and Mercer, Lucia, 4,482,119, Cl. 248-188.000.
Crawford, Wheeler C.: *See—*
Sung, Rodney L.; Sweeney, William M.; and Crawford, Wheeler C., 4,482,354, Cl. 44-57.000.
Creative Environments, Inc.: *See—*
Altemose, James L., 4,482,065, Cl. 211-74.000.
Creusot-Loire: *See—*
Savart, Bernard; and Ducournau, Alain, 4,481,883, Cl. 101-363.000.
Crimmins, Arthur G., Jr., to International Cyclo-Crane Licensing, A Virginia Partnership. Cyclorotor composite aircraft. 4,482,110, Cl. 244-26.000.
Crooks, Robert C., to Barcus-Berry, Inc. Reference load amplifier correction system. 4,482,866, Cl. 330-149.000.
Crosbie, Gary M., to Ford Motor Company. Method of reducing the green density of a slip cast article. 4,482,388, Cl. 106-287.100.
CROUZET: *See—*
Vergues, Jacques; and Rubet, Roland, 4,482,828, Cl. 310-83.000.
Crowe, Ruthie J.: *See—*
Mason, Rosetta; and Crowe, Ruthie J., 4,481,680, Cl. 2-174.000.
Crowley, Daniel J., to AMP Incorporated. Shunt. 4,482,198, Cl. 339-19.000.
Cuccio, John D.: *See—*
La Fata, John E.; and Cuccio, John D., 4,481,731, Cl. 446-15.000.
Cuche, Claude; and Kohler, Fritz, to Edouard Dubied & Cie. (Societe Anonyme). Knitting machine. 4,481,793, Cl. 66-75.200.
Cummings, Robert J., to United States of America, Air Force. Windblast arm protector assembly. 4,482,112, Cl. 244-122.0AG.
Cunniff, Kevin F., to United States of America, Air Force. Method for the fabrication of dielectric isolated junction field effect transistor and PNP transistor. 4,481,707, Cl. 29-580.000.
Curry, Willie M.; and Farb, David L., to Armour Pharmceutical Company. Composition of intravenous immune globulin. 4,482,483, Cl. 260-112.00R.
Cutts, William H. Sized textile yarn for weaving. 4,482,605, Cl. 428-375.000.
CVI Incorporated: *See—*
Sarcia, Domenico S., 4,481,777, Cl. 62-6.000.
Cwik, Norbert L., to Quaker Industries, Inc. Stable structurally rigid, mobile carriage assembly and base therefor. 4,482,164, Cl. 280-47.240.
Cyphelly, Ivan J., to Glyco-Antriebstechnik GmbH. Apparatus for passing a pressure medium from a stationary housing to a rotatable shaft. 4,481,976, Cl. 137-580.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Ishii, Taiji; and Tarutani, Takashi, 4,482,598, Cl. 428-195.000.
Daicel Chemical Industries, Ltd.: *See—*
Nishikawa, Kazuyuki; Hirao, Katsumi; Mizuguchi, Kazuhiko; and Suzuki, Hiroshi, 4,482,654, Cl. 523-145.000.
Daikin Kogyo Co., Ltd.: *See—*
Ishikawa, Nobuo; and Nakai, Takeshi, 4,482,729, Cl. 556-446.000.
Yoshimura, Tatsushiro; Honda, Norimasa; and Terada, Tsutomu, 4,482,476, Cl. 252-511.000.
Daimler-Benz Aktiengesellschaft: *See—*
Abthoff, Jorg; Schuster, Hans-Dieter; and Schmidt, Karlwalter, 4,481,841, Cl. 74-661.000.
Biber, Wolfgang; Stahle, Werner; and Stolz, Albert, 4,482,092, Cl. 237-12.30B.
Huber, Guntram; Fischer, Wolfgang; Haeberle, Fritz; Kleiner, Horst; Riechers, Daniel; Klie, Wolfgang; and Tomforde, Johann, 4,482,180, Cl. 293-120.000.
Stotz, Manfred; and Scheurenbrand, Dieter, 4,482,075, Cl. 220-86.00R.
Dainichiseika Colour & Chemicals Mfg. Co., Ltd.: *See—*
Nakamura, Tadamitsu; Iwamoto, Yogaku; Kadotani, Kanichi; and Marui, Tokuo, 4,482,467, Cl. 252-70.000.
D'Alessio, Michael S.; and Safier, Robert S., to Harsco Corporation. Shoring system and parts thereof. 4,481,748, Cl. 52-638.000.
Dambre, Paul: *See—*
De Bondt, Marc; D'Haene, Urbain; and Dambre, Paul, 4,481,996, Cl. 152-359.000.
Damiana, Norman G., to Damiana, Norman G. Storm window lock. 4,482,178, Cl. 292-175.000.
Damtoft, D. Stephans, Jr.: *See—*
Hindman, David B.; Wood, Norman E.; Foster, David N.; Damtoft, D. Stephans, Jr.; and Paduchowski, James S., 4,482,461, Cl. 210-741.000.

Danforth, Donald W., to Bolton-Emerson, Inc. Bi-directional rotor and stator in a vortical circulation pulper. 4,482,095, Cl. 241-46.110.

Daniel, Sam M.: *See*—
King, Thomas M.; Champlin, Cary R.; and Daniel, Sam M., 4,482,975, Cl. 364-608.000.

Daniels, James H., to General Signal Corporation. Load-frequency control system. 4,482,814, Cl. 290-40.00B.

Dargien Engineering Limited: *See*—
Cartwright, Winston G.; and Gater, Alan, 4,481,888, Cl. 109-50.000.

Darley, Henry M.; Houston, Theodore W.; and Kruger, James B., to Texas Instruments Incorporated. Method of making an improved MESFET semiconductor device. 4,481,704, Cl. 29-571.000.

Datta, Amitava, to Allegheny Ludlum Steel Corporation. Method for improving the magnetic permeability of grain oriented silicon steel. 4,482,397, Cl. 148-111.000.

Datta, Vijay J., to Grow Group, Inc. Marine anti-fouling paints. 4,482,652, Cl. 523-122.000.

Dauben, Dwight L.: *See*—
Wagner, Ovner R., Jr.; Murphy, Robert P., Jr.; Dauben, Dwight L.; and Smith, Roger L., 4,482,806, Cl. 250-260.000.

Daverio A.G.: *See*—
Killer, Viktor, 4,482,139, Cl. 270-52.000.

Davich, Luke J.: *See*—
Erickson, Jack A.; Davich, Luke J.; and Proulx, Richard W., 4,481,885, Cl. 102-467.000.

Davies, Aulette. Nail varnish composition containing nitrocellulose, abrasive particles and colloidal silica. 4,482,538, Cl. 424-61.000.

Davis, Burns: *See*—
Barbee, Robert B.; Bass, Roy K.; and Davis, Burns, 4,482,695, Cl. 528-208.000.

Davis, H. John: *See*—
Bowen, Christopher T.; Davis, H. John; and LeRoy, Rodney L., 4,482,448, Cl. 204-284.000.

Davis, Lorne A., Jr.; Brost, Dale F.; and Haskin, Helen K., to Texaco Inc. Chemical flood testing method. 4,482,634, Cl. 436-31.000.

Davis, William: *See*—
Bertram, James L.; Davis, William; and Walker, Louis L., 4,482,692, Cl. 528-93.000.

Davy McKee (London) Limited: *See*—
Dennis, Alan J.; Harrison, George E.; and Wyber, James P., 4,482,749, Cl. 568-454.000.

Dawson, Daniel J.: *See*—
Sheldon, Bernard G.; Wingard, Robert E., Jr.; Weinshenker, Ned M.; and Dawson, Daniel J., 4,482,680, Cl. 525-331.400.

Dawson, James M.; and Taylor, David J., to General Motors Corporation. Damping system for articulated vehicle. 4,482,165, Cl. 280-432.000.

Day, Harding W. Bulk tobacco barn furnace. 4,482,315, Cl. 432-189.000.

De Bondt, Marc; D'Haene, Urbain; and Dambre, Paul, to N. V. Bekaert S.A. Fatigue resistant cables. 4,481,996, Cl. 152-359.000.

Debono, Manuel: *See*—
Abbott, Bernard J.; Debono, Manuel; and Fukuda, David S., 4,482,487, Cl. 260-112.50R.

DEC International, Inc.: *See*—
Steingraber, Gary C.; and Mullen, Terrence J., 4,481,906, Cl. 119-14.320.

DeCuyper, Jacques; Broekaert, Edwin; and Van't Hoff, Joris, to Ceca S.A. Process for treating cassiterite ore. 4,482,454, Cl. 209-166.000.

Dees, John R.: *See*—
Bromley, James E.; and Dees, John R., 4,482,309, Cl. 425-131.500.

Degremont: *See*—
Rovel, Jean-Marie; Prevot, Claude; and Nicol, Roger, 4,482,458, Cl. 210-603.000.

Degterev, Alexandr P.: *See*—
Kljuev, Vladimir V.; Kozlov, Valery P.; Degterev, Alexandr P.; Vainberg, Irina A.; Demidov, Vladimir V.; and Filimonov, Anatoly N., deceased, 4,481,825, Cl. 73-655.000.

Degussa Aktiengesellschaft: *See*—
Ettlinger, Manfred; Ferch, Horst; Koth, Detlev; and Simon, Edgar, 4,482,642, Cl. 502-232.000.
Helmut, Beschke; Ludwig, Dahm; and Heinz, Friedrich, 4,482,719, Cl. 546-286.000.
Kleemann, Axel; Deller, Klaus; Drauz, Karlheinz; and Lehmann, Bernd, 4,482,760, Cl. 568-811.000.
Schwarze, Werner; and Kleemann, Axel, 4,482,759, Cl. 568-809.000.

Delancey, Warren: *See*—
Chakrawarti, Shekhar; Delancey, Warren; and Haydn, Michael, 4,482,291, Cl. 415-25.000.

Delano, Mark A., to Union Carbide Corporation. Process for the generation of a cold gas. 4,481,780, Cl. 62-52.000.

Della Greca, Antonio: *See*—
Brandi, Roberto; Bucaneve, Giovanni; Della Greca, Antonio; Sebastiani, Gaetano; Toffano, Francesco; and Vielmo, Paolo, 4,482,274, Cl. 405-224.000.

Della Torre, Giancarlo, to Rockwell-Rimoldi S.p.A. Device for sensing removal of stacked workpieces. 4,482,143, Cl. 271-18.300.

Deller, Klaus: *See*—
Kleemann, Axel; Deller, Klaus; Drauz, Karlheinz; and Lehmann, Bernd, 4,482,760, Cl. 568-811.000.

Deller, Nigel A.: *See*—
Ironside, John M.; Deller, Nigel A.; Sainsbury, Clive R.; and Weston, Paul, 4,481,844, Cl. 74-866.000.

Demidov, Vladimir V.: *See*—
Kljuev, Vladimir V.; Kozlov, Valery P.; Degterev, Alexandr P.; Vainberg, Irina A.; Demidov, Vladimir V.; and Filimonov, Anatoly N., deceased, 4,481,825, Cl. 73-655.000.

Denka Consultant & Engineering Co., Ltd.: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Ishii, Masaji; Hagiwara, Hirotoshi; and Hiraoka, Hideo, 4,482,838, Cl. 313-336.000.
Wada, Tetsuya; Ishii, Masaji; Miyai, Akira; and Hagiwara, Hirotoshi, 4,482,839, Cl. 313-346.00R.

Dennis, Alan J.; Harrison, George E.; and Wyber, James P., to Davy McKee (London) Limited. Hydroformylation process. 4,482,749, Cl. 568-454.000.

Dennis, Kent S.: *See*—
Bozzelli, John W.; Dennis, Kent S.; and Donate, Felipe A., 4,482,771, Cl. 585-10.000.

Dent, Hugh R., to Sterimatic Holdings Limited. Fitments for injection devices. 4,482,348, Cl. 604-198.000.

Depweg, Frank A., to Litton Industrial Products, Inc. Spindle powered adjustable chuck. 4,482,163, Cl. 279-1.00H.

DeSalve, Dennis W.: *See*—
Mort, Charles B.; and DeSalve, Dennis W., 4,482,415, Cl. 156-91.000.

Desborough, Colin L.: *See*—
Loosemore, William R.; Watkins, Roger D.; and Desborough, Colin L., 4,481,811, Cl. 73-198.000.

Desmond, Michael J.; Benton, Kenneth C.; and Weinert, Raymond J., to Standard Oil Company, The. Catalysts for the polymerization of ethylene. 4,482,639, Cl. 502-117.000.

de Sorgo, Miksa: *See*—
Brown, George L.; de Sorgo, Miksa; and Spencer, Arthur T., 4,482,673, Cl. 525-119.000.

de Souza, Noel J.: *See*—
Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., 4,482,556, Cl. 424-251.000.

Deta Corporation: *See*—
Kiehl, William C.; and McEwen, James P., 4,482,258, Cl. 368-90.000.

Deutsche Forschungs, und Verschsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Lorenz, Dieter, 4,482,252, Cl. 356-448.000.

DeVera, Dennis; and Tzoumis, Nicholas, to Eaton Corporation. Dual sealing fluid connector. 4,482,172, Cl. 285-137.00R.

deVersterre, William I.; and Worden, Donald A., to Marotta Scientific Controls, Inc. Load-transfer mechanism. 4,481,801, Cl. 72-21.000.

de Weerd, Johan A.: *See*—
Smits, Johan G.; de Weerd, Johan A.; and Vuyk, Cor K., 4,481,745, Cl. 52-220.000.

Dewey, Keith L.; and Varrasso, Eugene C., to Owens-Corning Fiberglas Corporation. Method for simultaneous reference junction compensation of a plurality of thermocouples. 4,482,261, Cl. 374-181.000.

Dewey, Ray S.: *See*—
Bochis, Richard J.; and Dewey, Ray S., 4,482,545, Cl. 424-181.000.

D'Haene, Urbain: *See*—
De Bondt, Marc; D'Haene, Urbain; and Dambre, Paul, 4,481,996, Cl. 152-359.000.

DIA-Nielsen USA, Inc.: *See*—
Geiger, Carl, 4,482,904, Cl. 346-140.00A.

Dias, J. Fleming; Karrer, H. Edward; Larson, John D., III; Wilson, David A.; and Hanafy, Amin M., to Hewlett-Packard Company. Acoustic imaging transducer. 4,482,834, Cl. 310-327.000.

Dibrell, Benton L.; and Gandy, Richard G., to Hughes Tool Company. Cold set cement composition and method. 4,482,379, Cl. 106-76.000.

Dick, James H.: *See*—
Samuelson, Michael A.; and Dick, James H., 4,482,189, Cl. 301-6.0CS.

Dickinson, Jack G. J. Spring operated animal traps. 4,481,730, Cl. 43-81.500.

Dierckxsens, Robert: *See*—
Verhoeven, Constant T.; Viellefont, Jean-Francois; and Dierckxsens, Robert, 4,481,963, Cl. 134-104.000.

Diery, Helmut: *See*—
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Dieser, John J., to Teledyne Industries, Inc. Method for eliminating distortion at the end of a tube bend. 4,481,803, Cl. 72-150.000.

Diffracto Ltd.: *See*—
Pryor, Timothy R., 4,482,960, Cl. 364-424.000.

Dillarstone, Alan: *See*—
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,471, Cl. 252-186.310.
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,477, Cl. 252-540.000.
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,630, Cl. 435-187.000.

Dilo, Johann P., to Oskar Dilo Maschinenfabrik KG. Fleece layering apparatus. 4,481,694, Cl. 19-296.000.

Di Luco, Eugene. Transfer/correcting ribbon. 4,482,262, Cl. 400-240.100.

DiMarcello, Frank V.: *See*—
Blyler, Lee L., Jr.; and DiMarcello, Frank V., 4,482,204, Cl. 350-96.340.
Dinkel, Rolf; Roedel, Hilmar; and Grayson, James I., to Lonza Ltd. Method for the production of 3-picoline. 4,482,717, Cl. 546-251.000.
Dionex Corporation: *See*—
Evans, Barton, Jr.; and Stolz, James B., 4,482,967, Cl. 364-499.000.
DiPippo, Carmine A., to James River Graphics, Inc. Light-sensitive diazonium trifluoromethane sulfonates. 4,482,489, Cl. 534-556.000.
Disco Abrasive Systems, Ltd.: *See*—
Tabuchi, Shuji, 4,481,738, Cl. 51-5.00R.
Disposable Waste Systems, Inc.: *See*—
Chambers, Joseph W., Sr., 4,482,194, Cl. 384-480.000.
Dix, James S., to Phillips Petroleum Company. Encapsulation of electronic components with calcium silicate-containing poly(arylene sulfide) compositions. 4,482,665, Cl. 524-262.000.
Dix, Joseph, to General Electric Company. Gatling gun control system. 4,481,859, Cl. 89-12.000.
Dixon, George G.: *See*—
Heal, John C. W.; and Dixon, George G., 4,482,848, Cl. 318-98.000.
Dixon, Richard: *See*—
El-Menshawy, El-Sayed; and Dixon, Richard, 4,482,537, Cl. 424-59.000.
Dobesh, Eugene L., to F. H. Maloney Company. Meter prover apparatus and method. 4,481,805, Cl. 73-3.000.
Doble, Henry P., Jr.: *See*—
Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., 4,482,063, Cl. 211-69.100.
Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., 4,482,064, Cl. 211-69.100.
Dochterman, Richard W., to General Electric Company. Torsional vibration isolating motor mounting arrangement and method of making the same. 4,482,124, Cl. 248-604.000.
Dr. Ing. Rudolf Hell GmbH: *See*—
Fischer, Gerhard; and Scheuter, Karl, 4,482,923, Cl. 358-283.000.
Gaulke, Werner; and Jung, Eggert, 4,482,917, Cl. 358-80.000.
Doemen, Benno; and Muller, Rolf, to Papst-Motoren GmBH & Co., K.G. Method and device for alignment of a brushless d.c. motor. 4,482,849, Cl. 318-254.000.
Doeteuchi, Masami: *See*—
Hirai, Kentaro; Ishiba, Teruyuki; Matsutani, Shigeru; Makino, Itsuo; Fujishita, Toshio; Doeteuchi, Masami; and Otani, Koichi, 4,482,566, Cl. 424-274.000.
Dohadwalla, Alihussein N.: *See*—
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Domenjoud, Daniel F.: *See*—
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Donate, Felipe A.: *See*—
Bozzelli, John W.; Dennis, Kent S.; and Donate, Felipe A., 4,482,771, Cl. 585-10.000.
Donermeyer, Donald D.; Martins, Joseph G.; and Fabel, David A., to Monsanto Company. Bonded reinforced plastic structures. 4,482,604, Cl. 428-336.000.
Doornek, James R.: *See*—
Watson, Gary E.; and Doornek, James R., 4,481,988, Cl. 144-193.00A.
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, to Farmitalia Carlo Erba S.p.A. Substituted 1H-pyrazolo (1,5-a) pyrimidines and process for their preparation. 4,482,555, Cl. 424-248.400.
Dorn, James D., to Brock Manufacturing, Inc. Bolt. 4,482,278, Cl. 411-377.000.
Dornauer, Horst: *See*—
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Dorschner, Terry A.: *See*—
Smith, Irl W., Jr.; and Dorschner, Terry A., 4,482,249, Cl. 356-350.000.
Dorst-Maschinen und Anlagenbau Otto Dorst und Dipl.-Ing. Walter Schlegel GmbH & Co.: *See*—
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Douglas Components Corporation: *See*—
Findley, Samuel A.; and Kubasiak, Duane T., 4,481,838, Cl. 74-493.000.
Douglas Dynamics, Inc.: *See*—
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Dousset, Rene , to Socapex. Optical fibre connector end fitting, process for centering a fibre in the end fitting and device for performing this process. 4,482,201, Cl. 350-96.200.
Dover Corporation: *See*—
Boeckman, Paul A.; and Young, Dennis L., 4,482,128, Cl. 251-163.000.
Dow Chemical Company, The: *See*—
Bertram, James L.; Davis, William; and Walker, Louis L., 4,482,692, Cl. 528-93.000.
Bon, Charles K., 4,482,436, Cl. 204-73.00R.
Bozzelli, John W., Dennis, Kent S.; and Donate, Felipe A., 4,482,771, Cl. 585-10.000.
Strom, Robert M., 4,482,754, Cl. 568-730.000.
Willis, Stephen B.; and Boyce, Pamela J., 4,482,667, Cl. 523-400.000.
Dow Corning Corporation: *See*—
Falender, James R.; and McHale, Angelika H., 4,482,498, Cl. 260-429.500.
Haluska, Loren A., 4,482,689, Cl. 528-25.000.
Saam, John C.; and Falender, James R., 4,482,670, Cl. 524-860.000.
Dowbenko, Rostyslaw: *See*—
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Draft Systems, Inc.: *See*—
Fallon, Merton R.; and Clements, Thomas W., 4,481,969, Cl. 137-116.500.
Dragone, Corrado; and Gans, Michael J., to AT&T Bell Laboratories. Multibeam segmented reflector antennas. 4,482,897, Cl. 343-779.000.
Dragone, Corrado; and Semplak, Ralph A., to AT&T Bell Laboratories. Antenna feed arrangement for correcting for astigmatism. 4,482,898, Cl. 343-781.00P.
Dragone, Corrado, to AT&T Bell Laboratories. Wide bandwidth hybrid mode feeds. 4,482,899, Cl. 343-786.000.
Drake, Charles A., to Phillips Petroleum Company. Purification. 4,482,433, Cl. 203-59.000.
Drake, Charles A., to Phillips Petroleum Company. Cleavage of hydroperoxides. 4,482,757, Cl. 568-798.000.
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Kleemann, Axel; Deller, Klaus; Drauz, Karlheinz; and Lehmann, Bernd, 4,482,760, Cl. 568-811.000.
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Dressell, Richard G., Jr.: *See*—
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Drummond, Todd, to Wembley Industries, Inc. Flexible material stacker. 4,481,896, Cl. 112-121.290.
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; and Chicherin, Jury E. Single-chip microcomputer. 4,482,950, Cl. 364-200.000.
D'Stefan, Donna A.: *See*—
Chow, Wing-Sun; Walton, Richard W.; and D'Stefan, Donna A., 4,482,345, Cl. 604-31.000.
Dubach, Werner F., to Alfatechnic AG. Safety closure cap for bottles. 4,482,070, Cl. 215-253.000.
Dubas, Henri; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Lubricant compositions containing nitrogen-containing polysulfide load-carrying additives. 4,482,463, Cl. 252-47.500.
Duchane, David V.; and Barthell, Barry L., to United States of America, Energy. Method of forming a thin unbacked metal foil. 4,481,999, Cl. 164-6.000.
Ducournau, Alain: *See*—
Savart, Bernard; and Ducournau, Alain, 4,481,883, Cl. 101-363.000.
Dufour, Mark D.: *See*—
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Dugas, Paul, to JAM Ind., Ltd. Control for musical instruments. 4,481,854, Cl. 84-1.190.
Duggan, Stephen R., to Medtronic, Inc. Acoustic signalling apparatus for implantable devices. 4,481,950, Cl. 128-419.0PT.
Duncan, Thomas A. Infant arm restraint. 4,481,942, Cl. 128-133.000.
Dunnavant, William R.: *See*—
Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., 4,482,653, Cl. 523-144.000.
Dunphy, James R.: *See*—
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duPont, Anthony A. Jet aircraft. 4,482,109, Cl. 244-12.500.
Du Pont de Nemours, E. I., and Company: *See*—
Hermolin, Joshua, 4,482,746, Cl. 568-342.000.
Herskovitz, Thomas; and Peet, William G., 4,482,635, Cl. 436-134.000.
Heytler, Peter G.; and Marsh, Frank D., 4,482,371, Cl. 71-27.000.
Hoorn, Willem A., 4,482,146, Cl. 271-127.000.
Woodhouse, Michael E., 4,482,609, Cl. 428-458.000.
Yunan, Malak E., 4,481,884, Cl. 102-313.000.
Duracell Inc.: *See*—
Turchan, Michael J., deceased; Moses, Peter R.; and Taylor, Alwyn H., 4,482,613, Cl. 429-53.000.
Durand-Wayland, Inc.: *See*—
Leverett, William H., 4,482,061, Cl. 209-592.000.
Durselen, Heinz: *See*—
Petrovic, Vladan; and Durselen, Heinz, 4,481,724, Cl. 34-168.000.
Dutcher, Daniel P., to Champion International Corporation. Carton with recessed opener. 4,482,056, Cl. 206-611.000.
Dutkewych, Oleh B.: *See*—
Gulla, Michael; and Dutkewych, Oleh B., 4,482,596, Cl. 428-131.000.
Dykstra, Donald P. Storage rack with an extendible shelf structure. 4,482,066, Cl. 211-151.000.
Dynamics Research Corporation: *See*—
Thomas, Lowell E., 4,482,207, Cl. 350-162.200.
Dynamit Nobel AG: *See*—
Kuhnrich, Robert; Schade, Gerhard; and Elmenthaler, Bernd, 4,482,700, Cl. 528-279.000.
Dynapac Maskin AB: *See*—
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Sheldon, Bernard G.; Wingard, Robert E., Jr.; Weinshenker, Ned M.; and Dawson, Daniel J., 4,482,680, Cl. 525-331.400.
Dziedzic, Leo M.; Idelman, Lloyd B.; and Sobol, Lawrence M., to International Harvester Co. Self-looking portable panel. 4,482,023, Cl. 180-89.170.

Dziuba, Peter: *See—*
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, 4,482,025, Cl. 180-255.000.

E. R. Squibb & Sons, Inc.: *See—*
Chow, Wing-Sun; Walton, Richard W.; and D'Stefan, Donna A., 4,482,345, Cl. 604-31.000.
Ondetti, Miguel A.; and Ryono, Denis E., 4,482,725, Cl. 548-533.000.
Wood, Thomas G.; and Oblack, Steven M., 4,482,387, Cl. 106-270.000.

Eagle Industry Co., Ltd.: *See—*
Ishitani, Kenichiro; Hamasaki, Toshiharu; Shiomi, Shoji; and Kawamura, Eiichi, 4,482,158, Cl. 277-3.000.
Ishitani, Kenichiro; and Kawamura, Eiichi, 4,482,159, Cl. 277-3.000.

Eastman, Alan D.; and Kimble, James B., to Phillips Petroleum Company. Oxidative dehydrogenation of paraffins. 4,482,646, Cl. 502-324.000.

Eastman Kodak Company: *See—*
Affolter, Peter, 4,482,903, Cl. 346-137.000.
Barbee, Robert B.; Bass, Roy K.; and Davis, Burns, 4,482,695, Cl. 528-208.000.
Brownstein, Scott A., 4,482,924, Cl. 358-302.000.
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,482,587, Cl. 428-35.000.
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,482,588, Cl. 428-35.000.
Twist, Peter J.; Bailey, Joseph; Briggs, Stuart P.; Mijovic, Miroslav V.; and Southby, David T., 4,482,626, Cl. 430-380.000.

Eaton Corporation: *See—*
DeVera, Dennis; and Tzoumis, Nicholas, 4,482,172, Cl. 285-137.00R.
Richards, Elmer A., 4,481,836, Cl. 74-331.000.
Ryczek, Lawrence J.; and Van Zeeland, Donald L., 4,482,818, Cl. 307-257.000.

Eberhard, Patrick; Mindt, Wolfgang; Palma, Jean-Pierre; Schafer, Robert; and Scharf, Robert, to Hoffmann-La Roche Inc. Method and apparatus for calibration of sensors. 4,481,804, Cl. 73-1.00G.

Echte, Adolf: *See—*
Hambrecht, Juergen; Reffert, Rudi W.; Muench, Volker; Echte, Adolf; and Swoboda, Johann, 4,482,705, Cl. 528-486.000.

Echterhof, Herbert: *See—*
Hetzel, Hartmut; Gupta, Pramod; Nast, Roland; Echterhof, Herbert; and Brocker, Ulrich, 4,482,750, Cl. 568-621.000.

Edelson, Steven D. Cathode ray tube display system with minimized distortion from aliasing. 4,482,893, Cl. 340-723.000.

Edouard Dubied & Cie. (Societe Anonyme): *See—*
Cuche, Claude; and Kohler, Fritz, 4,481,793, Cl. 66-75.200.

Edwards, Dean L.: *See—*
Bauman, Spencer S.; and Edwards, Dean L., 4,482,043, Cl. 198-339.000.

Edwards, Douglas C.: *See—*
Fischer, Erhardt; and Edwards, Douglas C., 4,482,657, Cl. 523-334.000.

Edwards, James T.: *See—*
Chen, Michael S.; Edwards, James T.; and Ernst, William R., 4,482,529, Cl. 423-243.000.

Edwards, Nora, legal representative: *See—*
Martin, Reginald, deceased; White, Winifred, legal representative; Edwards, Nora, legal representative; Brookes, John W.; and Reeve, Thomas S., 4,482,364, Cl. 55-158.000.

Efstratis, Ernest. Ventilator extension unit. 4,481,871, Cl. 98-40.00C.

Egraz, Jean Bernard: *See—*
Bousquet, Hubert; Egraz, Jean Bernard; and Ravet, Georges, 4,482,606, Cl. 428-402.200.

Eguchi, Takeo: *See—*
Moriya, Ryusuke; Eguchi, Takeo; and Ohba, Takeo, 4,482,928, Cl. 360-77.000.

Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Steered and driven axle-end assembly. 4,482,025, Cl. 180-255.000.

Einstabland, Tomas B.; and Olsen, Olav, to Ingenior F. Selmer A/S. Floating platform structure. 4,481,899, Cl. 114-264.000.

Eisai Co., Ltd.: *See—*
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Inai, Yuichi; Suzuki, Yoshikazu; and Tagaya, Osamu, 4,482,734, Cl. 560-104.000.

Eisenberg, Arnold J., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming glass fibers. 4,482,370, Cl. 65-1.000.

Electro-Nucleonics, Inc.: *See—*
Saylor, Richard, 4,482,251, Cl. 356-418.000.

Electrolyser Corporation Ltd., The: *See—*
Bowen, Christopher T.; Davis, H. John; and LeRoy, Rodney L., 4,482,448, Cl. 204-284.000.

Electronics Corporation of America: *See—*
Cade, Phillip J., 4,482,312, Cl. 431-31.000.

Elgin Molded Plastics: *See—*
Lindner, Henry, 4,482,941, Cl. 362-186.000.

Eli Lilly and Company: *See—*
Abbott, Bernard J.; Debono, Manuel; and Fukuda, David S., 4,482,487, Cl. 260-112.50R.
Cooper, Robin D. G.; Graves, Bernard J.; and Lavagnino, Edward R., 4,482,553, Cl. 424-246.000.
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., 4,482,488, Cl. 260-112.50R.
Krumkalns, Eriks V., 4,482,712, Cl. 544-54.000.

Elkay Manufacturing Company: *See—*
Farrell, Gerald J.; and Mayer, Edward, 4,481,971, Cl. 137-315.000.

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Krogsrud, Harald, 4,482,317, Cl. 432-238.000.

El-Menshawy, El-Sayed; and Dixon, Richard, to Charles of the Ritz Group Ltd. Skin conditioning composition. 4,482,537, Cl. 424-59.000.

Elmenthaler, Bernd: *See—*
Kuhnrich, Robert; Schade, Gerhard; and Elmenthaler, Bernd, 4,482,700, Cl. 528-279.000.

Elmslie, James C., to General Motors Corporation. Automotive air conditioning compressor control system. 4,481,784, Cl. 62-133.000.

Emmett, Manley D.; and McNellis, Robert L. Method for forming multilayered electroluminescent device. 4,482,580, Cl. 427-66.000.

Emmett, Robert C., to Envirotech Corporation. Lime slaking and grit removal process utilized in SO_2 removal. 4,482,528, Cl. 423-242.000.

Emmons, J. Bruce. Arrangement for mounting and steering an outboard motor. 4,482,332, Cl. 440-53.000.

Ems, Stephen C.; and Yamrone, Brian M., to LeCroy Research Systems Corporation. Programmable delay device. 4,482,826, Cl. 307-602.000.

Endress u. Hauser GmbH u. Co.: *See—*
Luder, Ernst; Kallfass, Traugott; and Borgwardt, Christian, 4,482,882, Cl. 338-34.000.

Endure, Inc.: *See—*
Voorhees, Joseph E., 4,482,005, Cl. 165-2.000.

Energiagazdalkodasi Intezet: *See—*
Pecz, Peter; and Hivessy, Geza, 4,481,783, Cl. 62-101.000.

Energy Equipment Company Limited, The: *See—*
Caplin, Peter B., 4,482,359, Cl. 48-89.000.

Enever, James A.: *See—*
Palgrave, Derek A.; Waite, Frederick A.; Birchall, James D.; Cooper, John; and Enever, James A., 4,482,372, Cl. 71-35.000.

Engelsmann, Dieter; Hackenberg, Hubert; and Torke, Renate, to Agfa-Gevaert Aktiengesellschaft. Film Cartridge and/or camera with film arresting means. 4,482,232, Cl. 354-275.000.

Enk, William A.; and Migis, Ronald, to Enk, William A. Fire protection system for aircraft. 4,482,018, Cl. 169-62.000.

Enomoto, Seiji: *See—*
Nozaki, Shigeki; Takemae, Yoshihiro; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,482,825, Cl. 307-578.000.

Enriquez, Emanuel E.; and MacDonald, Robert C., to Westinghouse Electric Corp. Elevator emergency control system. 4,482,032, Cl. 187-29.00R.

Envirotech Corporation: *See—*
Emmett, Robert C., 4,482,528, Cl. 423-242.000.

Enzinger, Georg: *See—*
Rus, Harald; and Enzinger, Georg, 4,481,917, Cl. 123-190.00C.

Erickson, Jack A.; Davich, Luke J.; and Proulx, Richard W., to Federal Cartridge Corporation. One-piece shotshell. 4,481,885, Cl. 102-467.000.

Ernst, Horst M.: *See—*
Walter, Lothar; Brandentein, Manfred; Ernst, Horst M.; and Olschewski, Armin, 4,482,338, Cl. 464-167.000.

Ernst Leitz Wetzlar GmbH: *See—*
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Ernst Menzi AG: *See—*
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Eryman, William S.: *See—*
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Escandell, Manuel, to Westaflex-Werk L.U.F. Westerbarkey GmbH & Co. Method of manufacturing helically wound tubes and tubes manufactured by said method. 4,481,978, Cl. 138-122.000.

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Glattfelder, Adolf; Guttinger, Heinz; and Mercx, Josef, 4,481,799, Cl. 72-8.000.

Esselborn, Reiner: *See—*
Franz, Klaus-Dieter; Ambrosius, Klaus; Esselborn, Reiner; and Kieser, Manfred, 4,482,389, Cl. 106-291.000.

Estruch, Jose , to Fabrilmalla, Inc. Reversible uni-sex garment. 4,481,683, Cl. 2-400.000.

Eterna-Tec Corporation: *See—*
Miller, Charles H., 4,482,384, Cl. 106-92.000.

Ethicon, Inc.: *See—*
Alpern, Marvin; and Genova, Thomas F., 4,482,053, Cl. 206-439.000.

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Hanlon, J. Vincent, 4,482,353, Cl. 44-57.000.
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Ramachandran, Venkataraman, 4,482,502, Cl. 260-465.00G.
Sanders, Robert N.; and Laurent, Sebastian M., 4,482,530, Cl. 423-329.000.

Ettlinger, Manfred; Ferch, Horst; Koth, Detlev; and Simon, Edgar, to Degussa Aktiengesellschaft. Process for the production of slugs of pyrogenically produced oxides. 4,482,642, Cl. 502-232.000.

Etudes Techniques et Representations Industrielles E.T.R.I.: *See—*
Grignon, Robert, 4,482,302, Cl. 417-354.000.

Eue, Ludwig: *See—*
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert, 4,482,736, Cl. 560-255.000.

Eulass, David S. Water powered sump pump. 4,482,299, Cl. 417-54.000.

Evans, Barton, Jr.; and Stolz, James B., to Dionex Corporation. Conductivity detector and method. 4,482,967, Cl. 364-499.000.
Ewell, Anthony J.: *See*—
Haff, Lawrence A.; and Ewell, Anthony J., 4,482,482, Cl. 260-112.00R.
Extrude Hone Corporation: *See*—
Risko, Donald G., 4,482,860, Cl. 324-61.00P.
Exxon Research & Engineering Co.: *See*—
Austin, Richard G.; and Michaelson, Robert C., 4,482,763, Cl. 568-860.000.
Berstein, Patricio; and Stephens, Walter R., 4,482,964, Cl. 364-465.000.
Beyerlein, Robert A.; Jacobson, Allan J.; and Poeppelmeier, Kenneth R., 4,482,644, Cl. 502-303.000.
Koetsier, Wicher T., 4,482,774, Cl. 585-481.000.
Luebbe, Ray H., Jr.; and Carter, Mark A., 4,482,599, Cl. 428-212.000.
Rosenfeld, Daniel D.; and Barthomeuf, Denise M., 4,482,776, Cl. 585-828.000.
Eylon, Daniel; and Froes, Francis H., to United States of America, Air Force. Method for refining microstructures of cast titanium articles. 4,482,398, Cl. 148-11.50F.
F. H. Maloney Company: *See*—
Dobesh, Eugene L., 4,481,805, Cl. 73-3.000.
Fabel, David A.: *See*—
Donermeyer, Donald D.; Martins, Joseph G.; and Fabel, David A., 4,482,604, Cl. 428-336.000.
Fabrilmalla, Inc.: *See*—
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Fabry, Laszlo: *See*—
Sugar, Andras; and Fabry, Laszlo, 4,482,535, Cl. 424-49.000.
Facklam, Roger L., to United States of America, Air Force. Laser clock. 4,482,259, Cl. 368-118.000.
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, to Eastman Kodak Company. Bonding compositions and shaped articles utilizing the bonding compositions. 4,482,587, Cl. 428-35.000.
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, to Eastman Kodak Company. Bonding compositions and shaped articles utilizing the bonding compositions. 4,482,588, Cl. 428-35.000.
Fairchild Camera & Instrument Corporation: *See*—
Burke, Gary R., 4,482,953, Cl. 364-200.000.
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,482,794, Cl. 219-56.220.
Falender, James R.; and McHale, Angelika H., to Dow Corning Corporation. Color stable chelated titanate compositions. 4,482,498, Cl. 260-429.500.
Falender, James R.: *See*—
Saam, John C.; and Falender, James R., 4,482,670, Cl. 524-860.000.
Falk, David O., to Marathon Oil Company. Selectively plugging subterranean formations with a hydrocarbon soluble fluid. 4,482,015, Cl. 166-288.000.
Fallon, Merton R.; and Clements, Thomas W., to Draft Systems, Inc. Fluid pressure control device. 4,481,969, Cl. 137-116.500.
Fanuc Ltd.: *See*—
Inaba, Hajimu; and Sakakibara, Shinsuke, 4,482,968, Cl. 364-513.000.
Kawada, Shigeki; Ishida, Hiroshi; and Kouno, Shinichi, 4,482,854, Cl. 318-801.000.
Farag, Samir F.; and Kleinecke, John D., to Siemens-Allis, Inc. Caution lamp for high voltage controller. 4,482,892, Cl. 340-654.000.
Farb, David L.: *See*—
Curry, Willie M.; and Farb, David L., 4,482,483, Cl. 260-112.00R.
Farber, Heinrich: *See*—
Bauer, Walter; Farber, Heinrich; and Schneider, Rudolf, 4,482,233, Cl. 354-312.000.
Farmer, Douglas A., Jr.: *See*—
Trotz, Samuel I.; and Farmer, Douglas A., Jr., 4,482,715, Cl. 546-6.000.
Farmer, Stanley E.; and Seaberg, Richard D., to Cascade Corporation. Forklift truck push-pull slipsheet handler for facilitating conversion of truck between slipsheet handling and pallet handling capabilities. 4,482,286, Cl. 414-607.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,482,555, Cl. 424-248.400.
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,482,565, Cl. 424-270.000.
Farrell, Gerald J.; and Mayer, Edward, to Elkay Manufacturing Company. Regulator and shut-off valve assembly. 4,481,971, Cl. 137-315.000.
Farrish, Dean T.: *See*—
Altshuler, John H.; and Farrish, Dean T., 4,481,946, Cl. 604-4.000.
Faubert, Jacques: *See*—
Corbeil, Romain; Faubert, Jacques; and Trudeau, Marcel, 4,482,123, Cl. 248-542.000.
Faucon, Roger: *See*—
Le Bayon, Rene; Faucon, Roger; and Legrix, Jacqueline, 4,482,617, Cl. 429-143.000.
Fayard, Jean F.: *See*—
Riou, Claude R.; and Fayard, Jean F., 4,482,378, Cl. 106-14.500.
Federal Cartridge Corporation: *See*—
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Federal-Mogul Corporation: *See*—
Johnson, Steven M., 4,482,462, Cl. 210-752.000.
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Feher nee Ravasz, Magda: *See*—
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Fehrenbacher, Wolfgang, to Kieninger & Obergfell. Electromechanical clock. 4,482,260, Cl. 368-180.000.
Feldkamper, Richard; and Philipp, Bernhard, to Windmoller & Holscher. Apparatus for supplying suction air to rotary applicator. 4,482,145, Cl. 271-95.000.
Feldman, James A.: *See*—
Funk, Gary L.; and Feldman, James A., 4,482,969, Cl. 364-500.000.
Felix, Raymond A., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,482,504, Cl. 260-502.50F.
Ferch, Horst: *See*—
Ettlinger, Manfred; Ferch, Horst; Koth, Detlev; and Simon, Edgar, 4,482,642, Cl. 502-232.000.
Ferguson, Frank W.; Shell, John F.; and Hale, Steven D., to Ferguson, Frank W. Audio-visual teaching machine and control system therefor. 4,482,328, Cl. 434-310.000.
Ferlay, Aime : *See*—
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Fernandez, Carlos G.: *See*—
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Ferro Manufacturing Corporation: *See*—
Fudala, Chester S., 4,482,120, Cl. 248-372.100.
Fichot, Bernard: *See*—
Lacotte, Jean-Pierre; Fichot, Bernard; and Troude, Gilles, 4,482,803, Cl. 250-201.000.
Fichtel & Sachs AG: *See*—
Link, Achim, 4,482,037, Cl. 192-3.580.
Wossner, Felix; Axthammer, Ludwig; Heyer, Gunther; and Itzinger, Hermann, 4,482,036, Cl. 188-322.130.
Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, to VEB Kombinat Wolle und Seide. Arrangement of electrodes for monitoring thread breakage in ring spinning machines. 4,481,763, Cl. 57-81.000.
Filimonov, Anatoly N., deceased: *See*—
Kljuev, Vladimir V.; Kozlov, Valery P.; Degterev, Alexandr P.; Vainberg, Irina A.; Demidov, Vladimir V.; and Filimonov, Anatoly N., deceased, 4,481,825, Cl. 73-655.000.
Filimonova, Elena V., administrator: *See*—
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Filliman, Paul, to RCA Corporation. Level shifter for an automatic kinescope bias sampling system. 4,482,921, Cl. 358-243.000.
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Findley, Samuel A.; and Kubasiak, Duane T., to Douglas Components Corporation. Adjustable steering shaft. 4,481,838, Cl. 74-493.000.
Fink, Carl J. Wallboard fastener. 4,482,121, Cl. 248-489.000.
Finley, Joseph H.; and Liao, Hsiang P., to FMC Corporation. Process for the manufacture of alkyl diaryl phosphate esters. 4,482,506, Cl. 260-982.000.
Finnegan, Christopher D.; and Geiss, Arthur J. Refrigeration monitor system with remote signalling of alarm indications. 4,482,785, Cl. 179-5.00P.
Fischer, Erhardt; and Edwards, Douglas C., to Polysar Limited. Silica-polymer mixtures. 4,482,657, Cl. 523-334.000.
Fischer, Gerhard; and Scheuter, Karl, to Dr. Ing. Rudolf Hell GmbH. Method for autotypical tonal value analysis. 4,482,923, Cl. 358-283.000.
Fischer, Wolfgang: *See*—
Huber, Guntram; Fischer, Wolfgang; Haeberle, Fritz; Kleiner, Horst; Riechers, Daniel; Klie, Wolfgang; and Tomforde, Johann, 4,482,180, Cl. 293-120.000.
Fishbaugh, Byron L., to Goodyear Tire & Rubber Company, The. Hay rake. 4,481,758, Cl. 56-400.000.
Fisher, Robert J., to Fisher, Robert J. Electrically operated remote control rearview mirror. 4,482,211, Cl. 350-637.000.
Fjelstad, Joseph C., to Boeing Company, The. Methods and apparatus for electrochemically deburring perforate metallic clad dielectric laminates. 4,482,445, Cl. 204-129.430.
Flakt Aktiebolag: *See*—
Widerby, Lennart, 4,482,267, Cl. 403-377.000.
Flanagan, Joseph E.: *See*—
Witucki, Edward F.; and Flanagan, Joseph E., 4,482,404, Cl. 149-19.100.
Fletcher, Richard I. Fish conservation device. 4,481,904, Cl. 119-3.000.
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Hahn, Ortwin, 4,482,306, Cl. 425-4.00R.
Fluckiger, Raymond W.: *See*—
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Flynn, Arthur, Jr., to Metro-Tel Corp. Memory dialer system for use with plural telephones and having provision for stacking more than one user. 4,482,786, Cl. 179-90.00B.
FMC Corporation: *See*—
Finley, Joseph H.; and Liao, Hsiang P., 4,482,506, Cl. 260-982.000.
Wiethoff, Roger H.; and Heron, Bruce G., 4,481,862, Cl. 89-46.000.
Foam Cutting Engineers, Inc.: *See*—
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Foamink Company, Inc.: *See*—
Norman, Edward C., 4,482,648, Cl. 521-65.000.
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, to Farmitalia Carlo Erba S.p.A. β-Lactam-containing antibacterial agents and β-lactamase inhibitors. 4,482,565, Cl. 424-270.000.
Foley, John T.: *See*—
Bilstad, Arnold C.; and Foley, John T., 4,481,827, Cl. 73-861.000.
Fonseca, Oscar O. Aquarium with improved aerator and purifier. 4,481,905, Cl. 119-5.000.
Forbes, George M.; and Seaney, Robert J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Weight responsive intrusion detector using dual optical fibers. 4,482,890, Cl. 340-556.000.
Ford Motor Company: *See*—
Crosbie, Gary M., 4,482,388, Cl. 106-287.100.
Foreman, Kenneth M.; and Gilbert, Barry L., to United States of America, Energy. Diffuser for augmenting a wind turbine. 4,482,290, Cl. 415-2.00A.
Forest Laboratories, Inc.: *See*—
Blank, Izhak, 4,482,534, Cl. 424-28.000.
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert, to Bayer Aktiengesellschaft. Herbicidally active substituted phenoxycinnamic acid derivatives. 4,482,736, Cl. 560-255.000.
Forster, Rolf, to Bernhard Forster GmbH. Orthodontic spreader. 4,482,318, Cl. 433-7.000.
Foster, David N.: *See*—
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Foster, Martin C.: *See*—
Meltz, Gerald; Newman, Leon A.; Dunphy, James R.; and Foster, Martin C., 4,482,247, Cl. 356-343.000.
Fote, Alfred A.: *See*—
Schoolar, Richard B.; and Fote, Alfred A., 4,482,881, Cl. 338-15.000.
Fournier, Jacques M. A., to S.N.E.C.M.A. Object displacement sensor and device for measuring the rotation speed and vibration frequency of a rotor. 4,482,859, Cl. 324-61.0QS.
Franceschi, Giovanni: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,482,565, Cl. 424-270.000.
Franz, Klaus-Dieter; Ambrosius, Klaus; Esselborn, Reiner; and Kieser, Manfred, to Merck Patent Gesellschaft mit Beschrankter Haftung. Nacreous pigments. 4,482,389, Cl. 106-291.000.
Frass, Werner; and Mohr, Dieter, to Hoechst Aktiengesellschaft. Process for electrochemically modifying electrochemically roughened aluminum support materials and the use of these materials in the manufacture of offset printing plates. 4,482,444, Cl. 204-129.350.
Freitag, Dieter; Hucks, Uwe; and Meissner, Hans-Jurgen, to Bayer Aktiengesellschaft. High molecular weight aromatic polyesters and processes for their production. 4,482,694, Cl. 528-176.000.
Freitag, Dieter: *See*—
Serini, Volker; Mayska, Paul J.; Block, Hans-Dieter; and Freitag, Dieter, 4,482,693, Cl. 528-167.000.
French Systems, Inc.: *See*—
Hindman, David B.; Wood, Norman E.; Foster, David N.; Damtoft, D. Stephans, Jr.; and Paduchowski, James S., 4,482,461, Cl. 210-741.000.
Frick, Roger L., to Rosemount Inc. Control circuit for current to pressure converter. 4,481,967, Cl. 137-85.000.
Friedericy, Johan A.; and Towgood, Dennis A., to United States of America, Energy. Layered flywheel with stress reducing construction. 4,481,840, Cl. 74-572.000.
Fries, Richard W., to Northern Petrochemical Company. In situ process for producing an alpha olefin polymerization catalyst component. 4,482,638, Cl. 502-108.000.
Frito-Lay, Inc.: *See*—
Olds, Dale F., 4,482,575, Cl. 426-582.000.
Fritzsche, Werner: *See*—
Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, 4,481,763, Cl. 57-81.000.
Froderberg, Kenneth, to Norba Aktiebolag. Refuse collecting vehicles. 4,482,283, Cl. 414-492.000.
Frodrich, Horst: *See*—
Kesselring, Lutz; and Frodrich, Horst, 4,481,949, Cl. 128-360.000.
Froes, Francis H.: *See*—
Eylon, Daniel; and Froes, Francis H., 4,482,398, Cl. 148-11.50F.
Frommer, Elmar: *See*—
Herrmann, Guenter; Frommer, Elmar; Paetsch, Juergen; Reiss, Wolfgang; and Winderl, Siegfried, 4,482,764, Cl. 568-864.000.
Fuchs, Rainer; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Process for the preparation of trans-3-(z-2-chloro-2-aryl-vinyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid derivatives, and the use of intermediate products in agents for compating pests. 4,482,731, Cl. 560-08.000.
Fudala, Chester S., to Ferro Manufacturing Corporation. 6-Way manual seat adjuster. 4,482,120, Cl. 248-372.100.
Fuel-X-Tender Corporation: *See*—
Osgood, Gordon L.; and Reinhard, George G., 4,482,352, Cl. 44-53.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Takano, Toshio; and Kobayashi, Toshio, 4,481,877, Cl. 180-233.000.
Fuji, Masao: *See*—
Nakano, Taketo; Fuji, Masao; and Mizoguchi, Shozo, 4,482,003, Cl. 164-452.000.
Fuji Photo Co., Ltd.: *See*—
Akashi, Goro; Kitamoto, Tatsuji; and Okita, Tsutomu, 4,482,578, Cl. 427-44.000.
Fuji Photo Film Co., Ltd.: *See*—
Fujita, Susumu, 4,482,228, Cl. 354-195.120.
Namiki, Tomizo; Tago, Tomohisa; Totsuka, Mikio; and Shinozaki, Fumiaki, 4,482,625, Cl. 430-143.000.
Okita, Tsutomu; and Naruo, Kyoichi, 4,482,610, Cl. 428-483.000.
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, 4,482,627, Cl. 430-410.000.
Fujii, Hiroyuki: *See*—
Nishikawa, Mikio; Fujii, Hiroyuki; Tateno, Kenichi; and Yokozawa, Masami, 4,482,915, Cl. 357-72.000.
Fujii, Makoto; Ikuzawa, Akira; and Sullivan, Edward C., to Sony Corporation. Apparatus for supplying viscous material. 4,482,579, Cl. 427-64.000.
Fujimaki, Tatsuo: *See*—
Ogawa, Masaki; Hirata, Yasushi; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,481,995, Cl. 152-356.00R.
Fujimoto, Koichi; Nakayama, Eiji; and Nakao, Hideo, to Sankyo Company Limited. Process for preparing 3-alkoxymethylcephalosporin derivatives. 4,482,710, Cl. 544-28.000.
Fujimoto, Minoru; and Tanaka, Akihiro, to Hitachi, Ltd. Weld detector. 4,481,824, Cl. 73-643.000.
Fujimura, Takashi; Tomita, Yoshifumi; and Sawatari, Kiyoshi, to Hitachi, Ltd. Curved tube type ultra high pressure mercury arc discharge lamp device. 4,482,842, Cl. 313-634.000.
Fujioka, Takafumi: *See*—
Banno, Kazuo; Fujioka, Takafumi; Oshiro, Yasuo; and Nakagawa, Kazuyuki, 4,482,560, Cl. 424-258.000.
Fujishita, Kusuo; Sakamoto, Hideshi; Yamazawa, Tomio; and Yamaguchi, Junichi, to Chisso Corporation; and Japan Polypro Backing Co. Ltd. Primary backing of foamed polypropylene tapes and tufted carpets produced from the same. 4,482,595, Cl. 428-95.000.
Fujishita, Toshio: *See*—
Hirai, Kentaro; Ishiba, Teruyuki; Matsutani, Shigeru; Makino, Itsuo; Fujishita, Toshio; Doeteuchi, Masami; and Otani, Koichi, 4,482,566, Cl. 424-274.000.
Fujita, Makoto: *See*—
Kawamura, Ichiro; Hino, Izumi; and Fujita, Makoto, 4,482,991, Cl. 369-77.200.
Fujita, Susumu, to Fuji Photo Film Co., Ltd. Lens changeover mechanism for use in photographic camera. 4,482,228, Cl. 354-195.120.
Fujitsu Fanuc Limited: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,482,289, Cl. 414-736.000.
Fujitsu Limited: *See*—
Amemiya, Takeshi, 4,482,922, Cl. 358-282.000.
Mano, Toru; Fukuda, Takeshi; Fukushima, Toshitaka; Ueno, Kouji; and Tanaka, Kazuo, 4,482,914, Cl. 357-68.000.
Nozaki, Shigeki; Takemae, Yoshihiro; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,482,825, Cl. 307-578.000.
Oritani, Atsushi, 4,482,984, Cl. 365-154.000.
Tabuchi, Shuji, 4,481,738, Cl. 51-5.00R.
Unagami, Shigeyuki; Ihira, Kuninosuke; and Kaku, Takashi, 4,482,973, Cl. 364-602.000.
Fujiura, Masami: *See*—
Taketomo, Eiji; and Fujiura, Masami, 4,482,360, Cl. 55-16.000.
Fujiwara, Yoshiyuki: *See*—
Yamanashi, Fumiaki; Hayashi, Yuzo; and Fujiwara, Yoshiyuki, 4,482,473, Cl. 252-299.100.
Fukamachi, Yoshihiro: *See*—
Yasukochi, Takashi; and Fukamachi, Yoshihiro, 4,482,416, Cl. 156-133.000.
Fukuda, David S.: *See*—
Abbott, Bernard J.; Debono, Manuel; and Fukuda, David S., 4,482,487, Cl. 260-112.50R.
Fukuda, Takeshi: *See*—
Mano, Toru; Fukuda, Takeshi; Fukushima, Toshitaka; Ueno, Kouji; and Tanaka, Kazuo, 4,482,914, Cl. 357-68.000.
Fukuhara, Toru: *See*—
Yasukawa, Seiichi; Terui, Nobuhiko; and Fukuhara, Toru, 4,482,235, Cl. 354-402.000.
Fukuhara, Yoshio: *See*—
Koizumi, Hideo; Koseki, Isamu; Morita, Tadashi; Yamazaki, Shu; and Fukuhara, Yoshio, 4,482,837, Cl. 378-144.000.
Fukuoka, Takashi; and Kamata, Yoshikiyo, to Kioritz Corporation. Muffler for internal combustion engine. 4,482,028, Cl. 181-240.000.
Fukushima, Isao: *See*—
Nishijima, Hideo; Fukushima, Isao; and Hibi, Masao, 4,482,926, Cl. 360-14.200.
Fukushima, Toshitaka: *See*—
Mano, Toru; Fukuda, Takeshi; Fukushima, Toshitaka; Ueno, Kouji; and Tanaka, Kazuo, 4,482,914, Cl. 357-68.000.
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, to Citizen Watch Co., Ltd. Acoustic alarm device for watches. 4,482,257, Cl. 368-88.000.
Fulkerson, Larry R., to Norton Christensen, Inc. Mechanical wireline borehole packer. 4,482,013, Cl. 166-118.000.
Funada, Fumiaki: *See*—
Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, 4,482,212, Cl. 350-334.000.

Funakoshi, Satoshi; Morimoto, Kazuo; Kuboyama, Morio; Yanai, Nobuya; Yamada, Muneo; and Yokota, Hajime, to Green Cross Corp., The; and Morinaga Milk Industry Co., Ltd. Method of preparation of human urine origin colony-stimulating factor and kallikrein. 4,482,485, Cl. 260-112.00R.

Funk, Gary L.; and Feldman, James A., to Phillips Petroleum Company. Control of an alkylation reactor. 4,482,969, Cl. 364-500.000.

Furlenmeier, Andre ; and Lanz, Paul, to Hoffmann-La Roche Inc. Cephalosporin derivatives. 4,482,551, Cl. 424-246.000.

Furuhashi, Toshio: *See*—
Amano, Matsuo; Sugawara, Toru; Furuhashi, Toshio; and Imai, Masumi, 4,482,962, Cl. 364-431.110.

Furuichi, Tokinori: *See*—
Shimizu, Keizo; Takeda, Katunobu; Furuichi, Tokinori; Oguri, Masao; and Ikoma, Junichi, 4,482,992, Cl. 369-221.000.

Furukawa, Hiroshi; Saito, Yuichi; Imai, Akio; Yoshida, Nobuyuki; and Okamoto, Yasushi, to Sumitomo Rubber Industries, Ltd.; and Sumitomo Chemical Company, Limited. Diene rubber composition and tire using it in tread. 4,482,678, Cl. 525-236.000.

Furuno, Naoki: *See*—
Kanayama, Hisayasu; Sasaki, Yoshiaki; Furuno, Naoki; Sasaoka, Yoshitaka; and Tokita, Osamu, 4,482,382, Cl. 106-90.000.

Furutsu, Akira, to Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Tag attaching device. 4,482,087, Cl. 227-67.000.

Fussl, Erwin; and Waldert, Horst, to Maerz Ofenbau AG. Feeding apparatus for uniflow regenerative shaft furnaces for calcining limestone and similar mineral materials. 4,482,280, Cl. 414-21.000.

Fuwa, Shigehiro: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,481,742, Cl. 51-165.800.

Gabor, Laszlo: *See*—
Boor, Anna; Toth, Jozsef; Szen, Tamas; Gabor, Laszlo; Major nee Feistner, Piroska; and Holly, Sandor, 4,482,494, Cl. 260-397.400.

Gagliardi, Jean Claude, to M.B.F. Plastiques. System for retaining a cap with respect to the neck of a recipient. 4,482,073, Cl. 215-332.000.

Gallo, Joseph S. Fresh flower holder. 4,481,732, Cl. 47-55.000.

Galvin, Thomas M.: *See*—
Bandyopadhyay, Gautam; and Galvin, Thomas M., 4,482,481, Cl. 252-628.000.

Gandy, Richard G.: *See*—
Dibrell, Benton L.; and Gandy, Richard G., 4,482,379, Cl. 106-76.000.

Gans, Michael J.: *See*—
Dragone, Corrado; and Gans, Michael J., 4,482,897, Cl. 343-779.000.

Gardner, Keith L.; and Jones, Richard A., to B. F. Goodrich Company, The. Process for polymerization of vinyl monomers with improved kinetic rate profile. 4,482,684, Cl. 526-84.000.

Gardner, Roland C., to Clevepost, Inc. Support and cushioning tube. 4,482,054, Cl. 206-594.000.

Garlapaty, Venkat R., to Greenco Corp. Fluid operated device with improved sealing means. 4,481,869, Cl. 92-88.000.

Garrett Corporation, The: *See*—
Harris, Edward N., 4,482,039, Cl. 192-67.00R.

Gater, Alan: *See*—
Cartwright, Winston G.; and Gater, Alan, 4,481,888, Cl. 109-50.000.

Gaulke, Werner; and Jung, Eggert, to Dr. Ing. Rudolf Hell GmbH. Method for a reproduction of colored masters in four-color printing using color reduction. 4,482,917, Cl. 358-80.000.

Gavagan, James A.; Petersen, Carl M., III; and Ray, Michael J., to Irvin Industries, Inc. Compartment shade. 4,482,137, Cl. 267-157.000.

Gay, Eric L.: *See*—
Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., 4,482,063, Cl. 211-69.100.
Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., 4,482,064, Cl. 211-69.100.

Gebhardt, Uwe; Augart, Helmut; and Knecht, Adolf, to Warner-Lambert Company. Pharmaceutical compositions containing oxicam derivatives and process for their preparation. 4,482,554, Cl. 424-246.000.

Gee, Stewart G. W.: *See*—
Ludowyk, Christopher J.; and Gee, Stewart G. W., 4,481,817, Cl. 73-583.000.

Geiger, Carl, to DIA-Nielsen USA, Inc. Combination recorder pen and clip therefor. 4,482,904, Cl. 346-140.00A.

Geiss, Arthur J.: *See*—
Finnegan, Christopher D.; and Geiss, Arthur J., 4,482,785, Cl. 179-5.00P.

Gel, Inc.: *See*—
Zito, Ralph, Jr., 4,482,614, Cl. 429-70.000.

General Dynamics Corporation/Convair Div.: *See*—
Burgeson, John E.; and Kruse, Gary S., 4,482,878, Cl. 335-216.000.

General Dynamics, Pomona Division: *See*—
Auletti, Craig R., 4,482,513, Cl. 264-39.000.
Palmer, John P., 4,482,805, Cl. 250-227.000.

General Electric Company: *See*—
Castonguay, Roger N.; and Jencks, Charles L., 4,482,877, Cl. 335-191.000.
Dix, Joseph, 4,481,859, Cl. 89-12.000.
Dochterman, Richard W., 4,482,124, Cl. 248-604.000.
Haitko, Deborah A., 4,482,697, Cl. 528-215.000.
Hogue, Marcus P., 4,482,943, Cl. 362-363.000.
Hsieh, Benjamin C. B.; and Perugi, Archie H., 4,482,358, Cl. 48-77.000.
Keyes, Gary S.; Riederer, Stephen J.; Lambert, Thomas W.; and Stone, Barry N., 4,482,918, Cl. 358-111.000.
Lenahan, James B.; and Baier, Arnold A., 4,482,963, Cl. 364-463.000.
Shaw, David G., 4,482,478, Cl. 252-579.000.
Taub, Alan I., 4,482,402, Cl. 148-121.000.
Yializis, Angelo, 4,482,931, Cl. 361-273.000.

General Kinematics Corporation: *See*—
Kraus, Richard B., 4,482,046, Cl. 198-771.000.

General Motors Corporation: *See*—
Bart, John J., Jr., 4,482,101, Cl. 242-107.000.
Dawson, James M.; and Taylor, David J., 4,482,165, Cl. 280-432.000.
Elmslie, James C., 4,481,784, Cl. 62-133.000.
Johnson, James J., 4,482,179, Cl. 292-336.300.
Karau, Philip A.; Littrell, Marshall W.; and Brooks, John S., 4,481,925, Cl. 123-425.000.
Knape, Richard S., 4,482,094, Cl. 239-88.000.
Koza, Manfred, 4,482,265, Cl. 403-71.000.
Matouka, Michael F., 4,481,866, Cl. 91-375.00A.
Motte, Klaus B., 4,481,981, Cl. 139-426.00R.
Reuter, Reinhold J., 4,482,000, Cl. 164-34.000.
Rider, Frederick H., Jr.; and List, Joseph O., 4,482,176, Cl. 292-87.000.
Stark, Terrence L., 4,481,767, Cl. 60-303.000.
Tilly, Thomas; and Rogers, Lloyd W., Jr., 4,482,188, Cl. 297-473.000.
Wirth, Rick C., 4,481,913, Cl. 123-90.350.

General Motors-Holden's Limited: *See*—
Samuelson, Michael A.; and Dick, James H., 4,482,189, Cl. 301-6.0CS.

General Signal Corporation: *See*—
Bachle, Walter W., 4,481,697, Cl. 24-135.00R.
Daniels, James H., 4,482,814, Cl. 290-40.00B.
Korowitz, Simon; and McMenamin, Francis E., 4,482,980, Cl. 364-900.000.

Genicom Corporation: *See*—
Stewart, Robert T., Jr., 4,482,148, Cl. 271-273.000.

Genova, Thomas F.: *See*—
Alpern, Marvin; and Genova, Thomas F., 4,482,053, Cl. 206-439.000.

George, Kenneth E., Jr., to United States Steel Corporation. Apparatus for the automatic inducement of a magnetic field in an elongated article under test. 4,482,865, Cl. 324-263.000.

Georgia Tech Research Institute: *See*—
Khudenko, Boris M., 4,482,510, Cl. 261-91.000.

Geremia, Leo, to Tri-tech, Inc. Sealed toggle switch. 4,482,792, Cl. 200-302.300.

Geri, Don W.; and Hurtig, Roy E., to Geri Engineering, Inc. Automatic inflation system. 4,482,333, Cl. 441-30.000.

Geri Engineering, Inc.: *See*—
Geri, Don W.; and Hurtig, Roy E., 4,482,333, Cl. 441-30.000.

Gering, Gerhard: *See*—
Schneider, Franz; Bergmann, Ewald; and Gering, Gerhard, 4,481,847, Cl. 83-530.000.

Gerlach Industries, Inc.: *See*—
Iannelli, Frank M., 4,482,509, Cl. 261-64.00B.

German, Gary L., to Royal Keg Cooler Corporation. Insulated beer keg cooler. 4,481,791, Cl. 62-400.000.

Gesepa Anstalt Fur Patentverwertung: *See*—
Stadler, Reinhard, 4,482,069, Cl. 215-249.000.

Gessner, Rudolf: *See*—
Schleese, Eckhardt; Gessner, Rudolf; and Manke, Horst, 4,482,412, Cl. 156-51.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Unger, Eberhart; Stuckmann, Dieter; and Hein, Jurgen, 4,482,270, Cl. 405-145.000.

Gibbs, Don W. Knock-out game. 4,482,153, Cl. 273-85.00R.

Gibler, David L.: *See*—
Backlund, John G.; and Gibler, David L., 4,482,113, Cl. 244-129.500.

Giese, Hans-Joachim; Heiker, Walter R.; and Krohe, Wilfried, to Sigri Elektrographit GmbH. Method for heating carbon blanks. 4,482,314, Cl. 432-11.000.

Gilbert, Barry L.: *See*—
Foreman, Kenneth M.; and Gilbert, Barry L., 4,482,290, Cl. 415-2.00A.

Gilmore, David L. Measuring wheel. 4,481,715, Cl. 33-141.00B.

Givaudan Corporation: *See*—
Kaiser, Roman; and Lamparsky, Dietmar, 4,482,762, Cl. 368-840.000.

Glaenzer Spicer: *See*—
Orain, Michel A., 4,482,336, Cl. 464-111.000.

Glassby, Kenneth B., to Rockwell-Rimoldi S.p.A. Grasping device for stacked workpieces. 4,482,144, Cl. 271-21.000.

Glattfelder, Adolf; Guttinger, Heinz; and Mercx, Josef, to Escher Wyss Aktiengesellschaft. Arrangement for regulating a rolling mill for metal rolling. 4,481,799, Cl. 72-8.000.

Glaxo Group Limited: *See*—
Clitherow, John W., 4,482,552, Cl. 424-246.000.
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; Hayes, Norman F.; Bradshaw, John; Carter, Malcolm; and Wadsworth, Alan, 4,482,549, Cl. 424-244.000.

Glyco-Antriebstechnik GmbH: *See*—
Cyphelly, Ivan J., 4,481,976, Cl. 137-580.000.

Gobel, Wilhelm: *See*—
Musch, Rudiger; Gobel, Wilhelm; Muller, Eberhard; and Konter, Wolfgang, 4,482,676, Cl. 525-215.000.

Goeft, Manfred: *See*—
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, 4,482,025, Cl. 180-255.000.

Gold, Philip; and Tarjan, Peter P., to Cordis Corporation. Endocardial lead having helically wound ribbon electrode. 4,481,953, Cl. 128-786.000.

Golden, Patrick: *See*—
Camplin, Harry R.; and Golden, Patrick, 4,482,366, Cl. 55-273.000.

Goldstein, Albert; and Podell, Howard I. Coating process of elastomeric material. 4,482,577, Cl. 427-2.000.

Goller, Ernst; Kazmaier, Gunther; and Trissler, Hans D., to H. Stoll GmbH & Co. Mechanism for flat knitting machines and an operating method for the taking down of shaped knitted products. 4,481,795, Cl. 66-150.000.

Golobic, Robert A.; and Prosper, Lawrence J., to Joy Manufacturing Company. Rotary material processor. 4,482,253, Cl. 366-147.000.

Gomes, Daniel, to Abra Inc. Jointed article of furniture. 4,482,186, Cl. 297-441.000.

Goncalves, Antonin L., to L'Oreal. Dispensing cap for pressurized container. 4,482,082, Cl. 222-182.000.

Gonda, Michihiro: *See*—
Kaneko, Kazuo; Obara, Toshio; Gonda, Michihiro; Kickawa, Katsumasa; and Kanasugi, Mikiko, 4,482,905, Cl. 346-207.000.

Goodell, Chester E. Overhead fence assembly. 4,481,846, Cl. 83-438.000.

Goodlad, Morgan H.: *See*—
Cowie, William P.; Lawrence, Drummond M. P.; and Goodlad, Morgan H., 4,481,693, Cl. 17-46.000.

Goody, Edward W., to Torsiflex Limited. Flexible couplings. 4,482,335, Cl. 464-94.000.

Goodyear Tire & Rubber Company, The: *See*—
Fishbaugh, Byron L., 4,481,758, Cl. 56-400.000.
Smith, Richard R.; and Kern, Charles L., Jr., 4,482,586, Cl. 428-35.000.

Gordon, Harry W.; and Schaffner, Carl P., to Schmid Laboratories. Method for treating hypercholesterolemia with endomycin. 4,482,540, Cl. 424-116.000.

Goshorn, Lawrence A.; and Bradley, C. Earl, to International Robomation/Intelligence. Pneumatic control system for machines. 4,481,768, Cl. 60-327.000.

Goss, Gary J.: *See*—
Yu, Kin C.; and Goss, Gary J., 4,482,982, Cl. 364-900.000.

Gotting, Otto: *See*—
Hess, Walter; Nicolai, Franz; and Gotting, Otto, 4,482,584, Cl. 427-286.000.

Gotzmer, Carl: *See*—
Satkowski, John A.; Scheetz, Barry; Rizer, Janine M.; and Gotzmer, Carl, 4,482,385, Cl. 106-97.000.

Gould Inc.: *See*—
Stowe, David W.; and Kopera, Paul M., 4,482,203, Cl. 350-96.150.

Gould, William A. Acoustic trap for discharging fire arms. 4,482,027, Cl. 181-223.000.

Gozzo, Franco: *See*—
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; and Logoni, Angelo, 4,482,570, Cl. 424-304.000.

Graff, Roderich W. Method of and an apparatus for drying pulverulent materials. 4,481,721, Cl. 34-33.000.

Graham, John W., to Chambertin Corporation. Cleaning sponge connection for a wringer-type mop. 4,481,688, Cl. 15-119.00A.

Gram, Hans, to Brodrene Gram A/S. Mechanism for converting a cross-sectionally substantially u-shaped web of wrapping material into a wrapping tube. 4,482,341, Cl. 493-302.000.

Grand-Perret, Philippe; and Lerouge, Bernard, to Alsthom-Atlantique. Regulator system for a diesel electric locomotive. 4,482,813, Cl. 290-40.00R.

Grashow, Joseph, to Quick-Mount Manufacturing Company, Inc. Auto antenna mounting. 4,482,122, Cl. 248-514.000.

Graves, Bernard J.: *See*—
Cooper, Robin D. G.; Graves, Bernard J.; and Lavagnino, Edward R., 4,482,553, Cl. 424-246.000.

Grawi, Robert S. Stringed instrument for attachment to an electronic transducer. 4,481,856, Cl. 84-173.000.

Gray, George W.: *See*—
Carr, Neil; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Raynes, Edward P., 4,482,472, Cl. 252-299.100.

Gray, Roy A., to Phillips Petroleum Company. Hydrocarbon-halocarbon refrigerant blends. 4,482,465, Cl. 252-67.000.

Grayson, James I.: *See*—
Dinkel, Rolf; Roedel, Hilmar; and Grayson, James I., 4,482,717, Cl. 546-251.000.

Grayson, John R., to RainSoft Water Conditioning Company. Reverse osmosis liquid treating apparatus. 4,482,456, Cl. 210-134.000.

Graziani, Gabriele: *See*—
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; and Graziani, Gabriele, 4,482,561, Cl. 424-258.000.

Greck, Edward T., to Neat Products, Inc. Wire meat support. 4,481,874, Cl. 99-419.000.

Green Cross Corp., The: *See*—
Funakoshi, Satoshi; Morimoto, Kazuo; Kuboyama, Morio; Yanai, Nobuya; Yamada, Muneo; and Yokota, Hajime, 4,482,485, Cl. 260-112.00R.

Greenco Corp.: *See*—
Garlapaty, Venkat R., 4,481,869, Cl. 92-88.000.

Gregory, Howard D. Solar energy collector. 4,481,936, Cl. 126-439.000.

Grewal, Virinder; and Reindl, Werner, to Siemens Aktiengesellschaft. Mirror structure. 4,482,209, Cl. 350-642.000.

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Sheaffer, Benjamin L.; and Griffiths, John M., 4,481,911, Cl. 123-73.00R.

Grignon, Robert, to Etudes Techniques et Representations Industrielles E.T.R.I. Axial electric fan of the flat type. 4,482,302, Cl. 417-354.000.

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Grisel, Lucien: *See*—
Bouladon, Gabriel; and Grisel, Lucien, 4,481,741, Cl. 51-131.100.

Groeger, Theodore C.; and Groeger, Theodore O. Cold storage pack. 4,481,792, Cl. 62-457.000.

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Grognet, Jean-Claude J.: *See*—
Bauer, Daniel P.; Beck, Jean-Paul H.; and Grognet, Jean-Claude J., 4,481,961, Cl. 132-7.000.

Groom, Jay L., Jr.; Smith, Patricia J.; and Vair, Gary G., to International Business Machines Corporation. Digital device testing apparatus and method. 4,483,002, Cl. 371-29.000.

Grove, Louis C., Jr.: *See*—
Peterson, Charles A.; Grove, Louis C., Jr.; Miller, Robert C.; and Oates, Robert M., 4,482,930, Cl. 361-16.000.

Grover, George M., to Qdot Corporation. Waste heat boiler. 4,482,004, Cl. 165-1.000.

Grover, Roger. Drafting apparatus. 4,481,719, Cl. 33-437.000.

Grow Group, Inc.: *See*—
Datta, Vijay J., 4,482,652, Cl. 523-122.000.

Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., to Ashland Oil, Inc. Cyclopentadiene derivatives, method for preparing, and use thereof. 4,482,653, Cl. 523-144.000.

Gruber, Robert J.; Julien, Paul C.; and Yourd, Raymond A., III, to Xerox Corporation. Method of fusing toner compositions containing pyridinium tetrafluoroborates. 4,482,620, Cl. 430-99.000.

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Barry, Patrick E., 4,482,970, Cl. 364-517.000.

GTE Automatic Electric Labs Inc.: *See*—
Holden, James R., 4,482,948, Cl. 364-200.000.

GTE Products Corporation: *See*—
Blaisdell, Ronald G.; Hough, Harold L.; and Martenson, Richard B., 4,482,942, Cl. 362-293.000.
Pricenski, Theodore J.; and Parent, Edward D., 4,482,799, Cl. 219-275.000.
Ritsko, Joseph E.; and Acla, Howard L., 4,482,526, Cl. 423-61.000.

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Ackermann, Horst W.; and Guays, Jean-Pierre, 4,482,047, Cl. 206-219.000.

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Meggs, Daniel H., 4,482,081, Cl. 222-5.000.

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Gunther, Roland: *See*—
Koster, Karl H.; and Gunther, Roland, 4,481,695, Cl. 24-32.000.

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Hetzel, Hartmut; Gupta, Pramod; Nast, Roland; Echterhof, Herbert; and Brocker, Ulrich, 4,482,750, Cl. 568-621.000.

Gurak, Ronald W., to Signode Corporation. Ultrasonic friction-fusion method and apparatus. 4,482,421, Cl. 156-580.100.

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Glattfelder, Adolf; Guttinger, Heinz; and Mercx, Josef, 4,481,799, Cl. 72-8.000.

Guy, Fredrick A.; and Ball, Robert S., to Kimberly-Clark Corporation. System for protecting a rotary dryer from thermal stress. 4,481,722, Cl. 34-47.000.

Gygax, Claude-Andre ; Jaccard, Pierre-Ernest; and Jaunin, Jean-Pierre, to Omega, S.A. Timepiece for displaying both time and orientation of the timepiece relative to the terrestrial magnetic field. 4,482,255, Cl. 368-10.000.

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Goller, Ernst; Kazmaier, Gunther; and Trissler, Hans D., 4,481,795, Cl. 66-150.000.

Habata, Etsuroh; Ohshima, Nobumasa; and Kanatani, Kenji, to Matsushita Electric Industrial Co., Ltd. Positive-temperature-coefficient thermistor heating device. 4,482,801, Cl. 219-540.000.

Haberhauer, Helmuth; and Spingath, Gerhard, to Hoechst Aktiengesellschaft. Apparatus for developing an electrostatic latent image on a recording medium. 4,481,903, Cl. 118-653.000.

Hackenberg, Hubert: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; and Torke, Renate, 4,482,232, Cl. 354-275.000.

Haeberle, Fritz: *See*—
Huber, Guntram; Fischer, Wolfgang; Haeberle, Fritz; Kleiner, Horst; Riechers, Daniel; Klie, Wolfgang; and Tomforde, Johann, 4,482,180, Cl. 293-120.000.

Haemonetics Corporation: *See*—
Lueptow, Richard M.; and Peterson, Jeffrey J., 4,482,342, Cl. 494-21.000.

Hafele, Carl H. Valve structure. 4,482,127, Cl. 251-25.000.

Haff, Lawrence A.; and Ewell, Anthony J., to Pharmacia, Inc. Cesium trifluoroacetate solutions for the isolation of nucleic acids. 4,482,482, Cl. 260-112.00R.

Hafner, Martin; Hofmann, Karl; Schlagenhauf, Josef; Stumpp, Gerhard; and Trachte, Dietrich, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,482,093, Cl. 239-73.000.

Hagemann, Hermann: *See*—
Kuhle, Engelbert; and Hagemann, Hermann, 4,482,737, Cl. 560-115.000.

Hagiwara, Hirotoshi: *See*—
Ishii, Masaji; Hagiwara, Hirotoshi; and Hiraoka, Hideo, 4,482,838, Cl. 313-336.000.
Wada, Tetsuya; Ishii, Masaji; Miyai, Akira; and Hagiwara, Hirotoshi, 4,482,839, Cl. 313-346.00R.

Hahn, Ortwin, to FLEWU AG. Process and device for the production of essentially dry moldings made from foamed thermoplastic, e.g. polystyrol. 4,482,306, Cl. 425-4.00R.

Hain, Josef; and Landgraf, Hermann, to Siemens Aktiengesellschaft. Device for surface treatment of teeth. 4,482,322, Cl. 433-88.000.

Haitko, Deborah A., to General Electric Company. Process, complex and catalyst for preparation of polyphenylene oxide. 4,482,697, Cl. 528-215.000.

Hajos, Zoltan G.; and Wachter, Michael P., to Ortho Pharmaceutical Corporation. Synthesis of dioxabicyclo[3.2.1]octanes and oxepanes. 4,482,730, Cl. 549-448.000.

Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil, 4,482,497, Cl. 260-413.000.

Hale, Steven D.: *See*—
Ferguson, Frank W.; Shell, John F.; and Hale, Steven D., 4,482,328, Cl. 434-310.000.

Hall, Bradley G. Suspenders. 4,481,682, Cl. 2-326.000.

Hall, John F.: *See*—
Pettingell, Winslow L.; and Hall, John F., 4,482,391, Cl. 134-6.000.

Hallett, Peter: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; Hayes, Norman F.; Bradshaw, John; Carter, Malcolm; and Wadsworth, Alan, 4,482,549, Cl. 424-244.000.

Hallstrom, Arthur: *See*—
Rebhan, James R.; Rebhan, John C.; and Hallstrom, Arthur, 4,481,737, Cl. 49-385.000.

Haluska, Loren A., to Dow Corning Corporation. Process for the preparation of polymetallo(disily)silazane polymers and the polymers therefrom. 4,482,689, Cl. 528-25.000.

Hamada, Kazutaka: *See*—
Ishida, Takashi; and Hamada, Kazutaka, 4,482,135, Cl. 267-8.00R.

Hamasaki, Toshiharu: *See*—
Ishitani, Kenichiro; Hamasaki, Toshiharu; Shiomi, Shoji; and Kawamura, Eiichi, 4,482,158, Cl. 277-3.000.

Hambrecht, Juergen; Reffert, Rudi W.; Muench, Volker; Echte, Adolf; and Swoboda, Johann, to BASF Aktiengesellschaft. Removal of the catalyst from polyphenylene ethers. 4,482,705, Cl. 528-486.000.

Hambrecht, Juergen: *See*—
Schuster, Hans H.; Dreher, Hermann; and Hambrecht, Juergen, 4,482,696, Cl. 528-212.000.

Hamilton, Alfred S.: *See*—
Bohannon, William D., Jr.; and Hamilton, Alfred S., 4,482,413, Cl. 156-54.000.

Hamilton, Frederick D. Nail extractor. 4,482,131, Cl. 254-18.000.

Hamme, Kurt, to Zeiss Ikon AG. Mortise lock provided with bolt and latch. 4,481,796, Cl. 70-107.000.

Hampel, Daniel; and Bradshaw, John L., to RCA Corporation. Pattern recognition system using switched capacitors. 4,483,017, Cl. 382-17.000.

Hanafy, Amin M.: *See*—
Dias, J. Fleming; Karrer, H. Edward; Larson, John D., III; Wilson, David A.; and Hanafy, Amin M., 4,482,834, Cl. 310-327.000.

Handte, Reinhard; Matterstock, Karl; Bieringer, Hermann; and Kocher, Helmut, to Hoechst Aktiengesellschaft. Benzoxazolyloxy phenoxy esters and use as monocotyledonous weed grass herbicides. 4,482,373, Cl. 71-88.000.

Hankin, Benjamin. Adjustable sweatband for headgear. 4,481,681, Cl. 2-197.000.

Hankins, Ronald W. Pressurizing apparatus for partially filled containers. 4,482,072, Cl. 215-269.000.

Hanlon, J. Vincent, to Ethyl Corporation. Compression ignition fuel compositions. 4,482,353, Cl. 44-57.000.

Hanlon, J. Vincent, to Ethyl Corporation. Diesel fuel compositions. 4,482,355, Cl. 44-57.000.

Hanlon, J. Vincent, to Ethyl Corporation. Diesel fuel containing alkenyl succinimide. 4,482,356, Cl. 44-57.000.

Hanlon, J. Vincent, to Ethyl Corporation. Fuel Compositions. 4,482,357, Cl. 44-63.000.

Hannen, Rainer, to MSK-Verpackungs-Systeme Gesellschaft m.b.H. Equipment for covering stacked goods with shrinkable hoods. 4,481,754, Cl. 53-567.000.

Hannon, R. Douglas; and Lackman, George E. Weedless propeller. 4,482,298, Cl. 416-234.000.

Hans, Rudiger: *See*—
Brandenstein, Manfred; and Hans, Rudiger, 4,482,040, Cl. 192-88.00A.

Hans, Waldemar: *See*—
Knapp, Heinrich; Sauer, Rudolf; Hans, Waldemar; Linssen, Mathias; Peczkowski, Jurgen; and Krauss, Rudolf, 4,481,699, Cl. 29-157.10R.

Hardison, Leslie C., to ARI Technologies, Inc. Autocirculation apparatus. 4,482,524, Cl. 422-170.000.

Harju, Philip H.; and Call, Kenneth R., to Koppers Company, Inc. Preparation of crystalline TiO_2 as anatase and/or rutile in porous carriers. 4,482,643, Cl. 502-242.000.

Harman, Douglas G.; and Lambert, Ralph E., to Westinghouse Electric Corp. Method of peening the inside of a small diameter tube. 4,481,802, Cl. 72-53.000.

Haroutunian, David S.: *See*—
Alston, Lawrence E.; and Haroutunian, David S., 4,482,919, Cl. 358-152.000.

Harris Corporation: *See*—
Bailey, David C.; Burberry, Lee M.; Trimble, Donald E.; Bardos, Andrew M.; and Perry, Philip M., 4,482,902, Cl. 346-108.000.

Harris, Edward N., to Garrett Corporation, The. Pneumatic quick disconnect apparatus and methods. 4,482,039, Cl. 192-67.00R.

Harrison, George E.: *See*—
Dennis, Alan J.; Harrison, George E.; and Wyber, James P., 4,482,749, Cl. 568-454.000.

Harsco Corporation: *See*—
D'Alessio, Michael S.; and Safier, Robert S., 4,481,748, Cl. 52-638.000.

Hartigan, Richard J., Jr., to Albany International Corp. Wet press papermakers felt and method of fabrication. 4,482,601, Cl. 428-234.000.

Hartman, Joseph A.: *See*—
Brightman, Barrie; Niertit, Frank; and Hartman, Joseph A., 4,482,817, Cl. 307-257.000.

Haruki, Kazuhito: *See*—
Horii, Tetsuo; Nara, Seietsu; and Haruki, Kazuhito, 4,482,059, Cl. 209-569.000.

Harvey, Kenneth: *See*—
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Hasebe, Tetsuzi: *See*—
Ogasawara, Takashi; Hasebe, Tetsuzi; and Koriyama, Masayuki, 4,481,982, Cl. 139-435.000.

Hasegawa, Hiroshi, to Topre Corporation. Keyboard switch. 4,482,932, Cl. 361-288.000.

Hasegawa, Shumpei, to Honda Motor Co., Ltd. Method and device for atmospheric pressure-dependent correction of air/fuel ratio for internal combustion engines. 4,481,929, Cl. 123-494.000.

Hashimoto, Eigo; and Nanya, Takanori, to Citizen Watch Co., Ltd. Solid state complementary electrochromic display devices. 4,482,216, Cl. 350-357.000.

Haskell, Jacob D., to Advanced Micro Devices, Inc. Process for doping field isolation regions in CMOS integrated circuits. 4,481,705, Cl. 29-571.000.

Haskin, Helen K.: *See*—
Davis, Lorne A., Jr.; Brost, Dale F.; and Haskin, Helen K., 4,482,634, Cl. 436-31.000.

Hatanaka, Hideo: *See*—
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,482,257, Cl. 368-88.000.

Hattori, Toshihiko: *See*—
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Hauck, Warren. Single sleeper furniture having flexible support frame. 4,481,684, Cl. 5-18.00R.

Haugrud, Harvey L. Retractable hitch. 4,482,167, Cl. 280-491.00B.

Hauschild, Wolfgang; and Kruck, Dieter, to VDO Adolf Schindling AG. Monitoring device for delivering an alarm signal in dependency on a counter result. 4,482,884, Cl. 340-52.00D.

Havener, Richard D. System for tuning musical instruments. 4,481,857, Cl. 84-454.000.

Hayakawa, Shun-ichi: *See*—
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,482,501, Cl. 260-458.00C.

Hayashi, Mitsuo: *See*—
Sakakibara, Hideo; Satoi, Shuzo; Awata, Masashi; Sagai, Hitoshi; Hayashi, Mitsuo; Muto, Naoki; and Takada, Masaki, 4,482,707, Cl. 536-16.800.

Hayashi, Torahiko. Apparatus for manufacturing wrapped food products. 4,482,310, Cl. 425-132.000.

Hayashi, Yuzo: *See*—
Yamanashi, Fumiaki; Hayashi, Yuzo; and Fujiwara, Yoshiyuki, 4,482,473, Cl. 252-299.100.

Haydn, Michael: *See*—
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Hayes, Harry; Morton, Anthony J.; and Harvey, Kenneth, to Colgate-Palmolive Company. Extrudable dental cream. 4,482,536, Cl. 424-52.000.

Hayes, John B., to Kendall Company, The. Rib protector. 4,481,679, Cl. 2-2.000.

Hayes, Norman F.: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; Hayes, Norman F.; Bradshaw, John; Carter, Malcolm; and Wadsworth, Alan, 4,482,549, Cl. 424-244.000.

Heal, John C. W.; and Dixon, George G., to Marconi Company Limited, The. Controllable power source. 4,482,848, Cl. 318-98.000.
Heald, David L., to Xerox Corporation. Signal equalization in quadrilinear imaging CCD arrays. 4,482,909, Cl. 357-24.000.
Heartland Industries, Inc.: *See*—
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Heck, Rhomie L., III: *See*—
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Heide, Helga: *See*—
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Heideman, Robert; and Dressell, Richard G., Jr. Shock absorber. 4,482,035, Cl. 188-287.000.
Heiker, Walter R.: *See*—
Giese, Hans-Joachim; Heiker, Walter R.; and Krohe, Wilfried, 4,482,314, Cl. 432-11.000.
Hein, Jurgen: *See*—
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Heinecke, Rudolf A. H., to ITT Industries, Inc. Method of making aluminum alloy film by implanting silicon ions followed by thermal diffusion. 4,482,394, Cl. 148-1.500.
Heins, Sidney M., to Chempro Corporation. Separation of zinc from a zinc-copper alloy. 4,482,377, Cl. 75-101.00R.
Heinz, Friedrich: *See*—
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Heinzl, Alfred: *See*—
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Hellbach, Hans: *See*—
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Hellqvist, Kjell A., to Kockums AB. Method of detecting cracks in constructions. 4,481,818, Cl. 73-587.000.
Helmut, Beschke; Ludwig, Dahm; and Heinz, Friedrich, to Degussa Aktiengesellschaft. Process for obtaining 3-cyanopyridine. 4,482,719, Cl. 546-286.000.
Henderson, Donald L., Sr., to Burroughs Corporation. High capacity memory cell having a charge transfer channel covered by a stepped insulating layer. 4,482,908, Cl. 357-23.600.
Henderson, Henning M. Perforated cover assembly. 4,482,077, Cl. 220-374.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Reuter, Herbert; Pioch, Lothar; Schmid, Karl-Heinz; and Seiter, Wolfgang, 4,482,470, Cl. 252-162.000.
Hercules Incorporated: *See*—
Berta, Dominic A.; and Kyllingstad, Vernon L., 4,482,681, Cl. 525-349.000.
Heredero, Juan L., to Piher Sociedad Anonima. Annular potentiometer with terminal. 4,482,883, Cl. 338-163.000.
Hermecz, Istvan: *See*—
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,482,557, Cl. 424-251.000.
Hermolin, Joshua, to Du Pont de Nemours, E. I., and Company. Staged catalyst process for cyclohexyl hydroperoxide decomposition. 4,482,746, Cl. 568-342.000.
Herold, Frank: *See*—
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Heron, Bruce G.: *See*—
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Herren, Dietmar: *See*—
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Herrmann, Guenter; Frommer, Elmar; Paetsch, Juergen; Reiss, Wolfgang; and Winderl, Siegfried, to BASF Aktiengesellschaft. Preparation of diols. 4,482,764, Cl. 568-864.000.
Herskovitz, Thomas; and Peet, William G., to Du Pont de Nemours, E. I., and Company. Composition, indicator, process and device for detecting carbon monoxide. 4,482,635, Cl. 436-134.000.
Hess, Walter; Nicolai, Franz; and Gotting, Otto, to Mannesmann AG. Painting a band on a tube. 4,482,584, Cl. 427-286.000.
Hetzel, Hartmut; Gupta, Pramod; Nast, Roland; Echterhof, Herbert; and Brocker, Ulrich, to Bayer Aktiengesellschaft. Process for removing alkaline catalysts from polyether polyols. 4,482,750, Cl. 568-621.000.
Hewitt, Michael J. Cored plastics profiles and manufacture of frames for windows and the like therefrom. 4,481,701, Cl. 29-416.000.
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Kovalick, Albert W., 4,482,974, Cl. 364-607.000.
Heydenreich, Lee: *See*—
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Heyer, Gunther: *See*—
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Heytler, Peter G.; and Marsh, Frank D., to Du Pont de Nemours, E. I., and Company. Method and composition for suppressing the nitrification of ammonium nitrogen in soil. 4,482,371, Cl. 71-27.000.
Hibi, Kunio; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, to Ricoh Co., Ltd. Sheet arranging system. 4,482,147, Cl. 271-229.000.
Hibi, Masao: *See*—
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Hicks, Irwin A., to Singer Company, The. Internal gate rotary vane fluid meter with controlled rotor vane aspect ratio. 4,481,812, Cl. 73-253.000.
Hideo, Oishi: *See*—
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Higby, Philip: *See*—
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Higley, Raymond H. Golf club alignment indicator apparatus. 4,482,155, Cl. 273-162.00B.
Hill, Bernhard; and Much, Gerd, to U.S. Philips Corporation. Device for applying light to a linear array of magneto-optical light switches, notably for optical printers. 4,482,214, Cl. 350-355.000.
Hill, Gerald R.: *See*—
Rutter, Christopher C.; and Hill, Gerald R., 4,481,753, Cl. 53-471.000.
Hille, Martin: *See*—
Ritschel, Werner; Diery, Helmut; and Hille, Martin, 4,482,724, Cl. 548-350.000.
Hilti Aktiengesellschaft: *See*—
Schiefer, Erwin, 4,482,277, Cl. 411-42.000.
Hinden, Milton. Longitudinal finned resistance weld pin. 4,482,795, Cl. 219-98.000.
Hindman, David B.; Wood, Norman E.; Foster, David N.; Damtoft, D. Stephans, Jr.; and Paduchowski, James S., to French Systems, Inc. Backwash control for constant volume-pressure filtration system. 4,482,461, Cl. 210-741.000.
Hino, Izumi: *See*—
Kawamura, Ichiro; Hino, Izumi; and Fujita, Makoto, 4,482,991, Cl. 369-77.200.
Hirai, Kentaro; Ishiba, Teruyuki; Matsutani, Shigeru; Makino, Itsuo; Fujishita, Toshio; Doeteuchi, Masami; and Otani, Koichi, to Teikoku Hormone Mfg. Co., Ltd. Substituted aminoalkylbenzene type lower acylamides. 4,482,566, Cl. 424-274.000.
Hirai, Masana: *See*—
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Hiramatsu, Seiichiro: *See*—
Tsuda, Tadashi; Hiramatsu, Seiichiro; Maeno, Tsuyoshi; and Ohtsuka, Mitsugi, 4,482,889, Cl. 340-514.000.
Hiramoto, Tatsumi, to Ushio Denki Kabushikikaisha. Semiconductor annealing device. 4,482,395, Cl. 148-1.500.
Hirano, Shigeo: *See*—
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Hirao, Katsumi: *See*—
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Hiraoka, Hideo: *See*—
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Hiraoka, Hiroyuki, to International Business Machines Corporation. Process for forming via holes having sloped walls. 4,482,427, Cl. 156-643.000.
Hirata, Hitoshi, to Pioneer Electronic Corporation. PLL Detection circuit having dual bandwidth loop filter. 4,482,869, Cl. 331-4.000.
Hirata, Yasushi: *See*—
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Nagase, Yukihiko; Kawasaki, Tetsuo; Hiromatsu, Masato; Asanabe, Sadao; and Saki, Kunio, 4,481,867, Cl. 91-487.000.
Hironari, Marushima: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.
Hirose, Tsuneo: *See*—
Suzuki, Naoyoshi; Hirose, Tsuneo; and Osaki, Humio, 4,482,543, Cl. 424-177.000.
Hirota, Toshiharu; Kano, Osamu; and Kato, Yoshiharu, to Murata Manufacturing Co., Ltd. Temperature compensating titanate ceramic capacitor with nickel or copper electroless metal electrodes. 4,482,934, Cl. 361-321.000
Hirvonen, Kullervo; and Karonen, Aimo, to Altim Control Ky. Method for identifying timber surface properties. 4,482,250, Cl. 356-369.000.
Hitachi Koki Company Limited: *See*—
Kurosawa, Makoto; Nakano, Hiroshige; Hosoya, Kensei; and Kobayashi, Tsuneki, 4,481,880, Cl. 101-93.040.
Hitachi, Ltd.: *See*—
Aizawa, Kuniomi; Ohyama, Yasuyoshi; Okuma, Yasuo; Okano, Yoshio; and Kitamura, Youichirou, 4,482,802, Cl. 235-379.000.

Amano, Matsuo; Sugawara, Toru; Furuhashi, Toshio; and Imai, Masumi, 4,482,962, Cl. 364-431.110.
Araki, Tutomu; and Kuwashima, Hidesumi, 4,481,776, Cl. 60-660.000.
Chiba, Akio; Shimizu, Seiki; Kuniya, Keiichi; and Onuki, Jin, 4,482,912, Cl. 357-67.000.
Fujimoto, Minoru; and Tanaka, Akihiro, 4,481,824, Cl. 73-643.000.
Fujimura, Takashi; Tomita, Yoshifumi; and Sawatari, Kiyoshi, 4,482,842, Cl. 313-634.000.
Itoh, Kiyoo; and Hori, Ryoichi, 4,482,985, Cl. 365-226.000.
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, 4,482,479, Cl. 252-630.000.
Kubota, Jun; Ishii, Junichi; and Sasaki, Soji, 4,481,822, Cl. 73-625.000.
Nishijima, Hideo; Fukushima, Isao; and Hibi, Masao, 4,482,926, Cl. 360-14.200.
Oritsuki, Ryoji; Ichimura, Yukio; Kanai, Hiromi; and Shimada, Kenichi, 4,482,804, Cl. 250-211.00J.
Sakai, Masao, 4,482,870, Cl. 331-86.000.
Shimizu, Keizo; Takeda, Katunobu; Furuichi, Tokinori; Oguri, Masao; and Ikoma, Junichi, 4,482,992, Cl. 369-221.000.
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, 4,482,703, Cl. 528-322.000.
Tanei, Hirayoshi; Iwanaga, Shoichi; Ikegami, Akira; Otsu, Hiroshi; and Isonae, Hiromi, 4,481,813, Cl. 73-336.500.
Tominaga, Hiroshi; Sase, Yoshihiro; and Horiuchi, Shoichi, 4,482,808, Cl. 250-392.000.
Yoneyama, Takao; Satoh, Ichiya; Obara, Sanshiro; Inoue, Tomoaki; and Koga, Tsuguaki, 4,481,819, Cl. 73-593.000.
Hitachi Metals, Ltd.: *See*—
Tabaru, Kazunori; Aoyama, Takafumi; and Kumakura, Toshio, 4,482,623, Cl. 430-137.000.
Hitachi Shipbuilding & Engineering Co., Ltd.: *See*—
Kitazawa, Kohji; and Ozaki, Toshio, 4,482,351, Cl. 44-1.00R.
Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,481,898, Cl. 114-74.00R.
Hivessy, Geza: *See*—
Pecz, Peter; and Hivessy, Geza, 4,481,783, Cl. 62-101.000.
Hochstein, Peter A.; and Shih, Kelvin. Audio amplifier. 4,483,016, Cl. 381-120.000.
Hodogaya Chemical Co., Ltd.: *See*—
Kaneko, Kazuo; Obara, Toshio; Gonda, Michihiro; Kickawa, Katsumasa; and Kanasugi, Mikiko, 4,482,905, Cl. 346-207.000.
Hoechst Aktiengesellschaft: *See*—
Frass, Werner; and Mohr, Dieter, 4,482,444, Cl. 204-129.350.
Haberhauer, Helmuth; and Spingath, Gerhard, 4,481,903, Cl. 118-653.000.
Handte, Reinhard; Matterstock, Karl; Bieringer, Hermann; and Kocher, Helmut, 4,482,373, Cl. 71-88.000.
Just, Christoph; Ritz, Jurgen; and Zimmermann, Rolf, 4,482,674, Cl. 525-124.000.
Kandler, Joachim; and Wolter, Manfred, 4,482,460, Cl. 210-706.000.
Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., 4,482,556, Cl. 424-251.000.
Lehr, Klaus; and Heymer, Gero, 4,482,527, Cl. 423-235.000.
Moraw, Roland; and Schadlich, Gunther, 4,482,241, Cl. 355-10.000.
Moraw, Roland; and Schaedlich, Guenther, 4,482,242, Cl. 355-10.000.
Pliefke, Engelbert, 4,482,434, Cl. 204-33.000.
Ritschel, Werner; Diery, Helmut; and Hille, Martin, 4,482,724, Cl. 548-350.000.
Schlegel, Albert, 4,482,380, Cl. 106-84.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Martin, Lawrence L.; and Setescak, Linda L., 4,482,547, Cl. 424-244.000.
Hoffmann, Dieter, to Kern & Co. AG. Adjusting base for geodetic instruments. 4,482,118, Cl. 248-180.000.
Hoffmann, Heino: *See*—
Werblinski, Dieter; and Hoffmann, Heino, 4,481,718, Cl. 33-317.00R.
Hoffmann-La Roche Inc.: *See*—
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,482,739, Cl. 564-54.000.
Eberhard, Patrick; Mindt, Wolfgang; Palma, Jean-Pierre; Schafer, Robert; and Scharf, Robert, 4,481,804, Cl. 73-1.00G.
Furlenmeier, Andre ; and Lanz, Paul, 4,482,551, Cl. 424-246.000.
Hofmann, Karl: *See*—
Hafner, Martin; Hofmann, Karl; Schlagenhauf, Josef; Stumpp, Gerhard; and Trachte, Dietrich, 4,482,093, Cl. 239-73.000.
Hofmann, Peter, to Chemische Werke Huels AG. Process for producing aliphatic nitriles. 4,482,503, Cl. 260-465.200.
Hogue, Marcus P., to General Electric Company. Tempered glass globe. 4,482,943, Cl. 362-363.000.
Holden, James R., to GTE Automatic Electric Labs Inc. Microprocessor bus interchange circuit. 4,482,948, Cl. 364-200.000.
Holfelder, Jurgen: *See*—
Beck, Siegfried; Holfelder, Jurgen; Straub, Steffen; and Schnaker, Aloys, 4,482,191, Cl. 303-52.000.
Hollett, Ronald J.: *See*—
Orsino, Joseph A.; Sawyer, Ernest R.; and Hollett, Ronald J., 4,482,618, Cl. 429-179.000.
Holly, Sandor: *See*—
Boor, Anna; Toth, Jozsef; Szen, Tamas; Gabor, Laszlo; Major nee Feistner, Piroska; and Holly, Sandor, 4,482,494, Cl. 260-397.400.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Honda, Shoichi; and Anno, Nobuo, 4,481,919, Cl. 123-198.00F.
Matsuda, Minoru; Shinozaki, Takashi; and Kato, Kentaro, 4,482,024, Cl. 180-219.000.
Ozaki, Syunzaburo, 4,481,923, Cl. 123-320.000.
Honda Motor Co., Ltd.: *See*—
Hasegawa, Shumpei, 4,481,929, Cl. 123-494.000.
Honda, Norimasa: *See*—
Yoshimura, Tatsushiro; Honda, Norimasa; and Terada, Tsutomu, 4,482,476, Cl. 252-511.000.
Honda, Shoichi; and Anno, Nobuo, to Honda Giken Kogyo Kabushiki Kaisha. Intake/exhaust valve assembly for an internal combustion engine. 4,481,919, Cl. 123-198.00F.
Honda, Shunsuke; Suzuki, Hideo; and Yahata, Haruki, to Tokyo Shibaura Denki Kabushiki Kaisha. Tranversal equalizer. 4,483,009, Cl. 375-14.000.
Honda, Tsuguo: *See*—
Kuroki, Hironori; and Honda, Tsuguo, 4,482,612, Cl. 428-683.000.
Honeywell Information Systems Inc.: *See*—
Yu, Kin C.; and Goss, Gary J., 4,482,982, Cl. 364-900.000.
Hoorn, Willem A., to Du Pont de Nemours, E. I., and Company. Dispenser of single film sheets. 4,482,146, Cl. 271-127.000.
Hoppe, Wally C.: *See*—
Bar-Cohen, Yoseph; Stubbs, David A.; and Hoppe, Wally C., 4,482,835, Cl. 310-327.000.
Hori, Ryoichi: *See*—
Itoh, Kiyoo; and Hori, Ryoichi, 4,482,985, Cl. 365-226.000.
Hori, Shinichi; Ohnishi, Yasuichi; Ono, Makoto; Ueda, Masahiro; and Noba, Masahiko, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Engine automatic control system for vehicles. 4,482,812, Cl. 290-38.00R.
Horii, Tetsuo; Nara, Seietsu; and Haruki, Kazuhito, to Tokyo Shibaura Denki Kabushiki Kaisha. Sorter with automatic push-out mechanism. 4,482,059, Cl. 209-569.000.
Horiuchi, Shoichi: *See*—
Tominaga, Hiroshi; Sase, Yoshihiro; and Horiuchi, Shoichi, 4,482,808, Cl. 250-392.000.
Horvath, Agnes: *See*—
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,482,557, Cl. 424-251.000.
Hosaka, Hideo: *See*—
Iwataki, Isao; Nakayama, Akira; Kaeriyama, Minoru; Ishikawa, Hisao; Hosaka, Hideo; Kohara, Kenichi; and Yamada, Shozo, 4,482,740, Cl. 564-99.000.
Hoshi, Akio: *See*—
Shigeta, Masatomo; Isii, Yosio; and Hoshi, Akio, 4,482,452, Cl. 208-177.000.
Hoshi, Toshio, to Komori Printing Machinery Co., Ltd. Method of and apparatus for printing serial numbers. 4,481,878, Cl. 101-23.000.
Hoshi, Tutomu: *See*—
Uda, Masahiro; Ohno, Satoru; and Hoshi, Tutomu, 4,482,134, Cl. 266-217.000.
Hosogaya, Kazuyoshi: *See*—
Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,481,898, Cl. 114-74.00R.
Hosono, Nagao; and Isaka, Kazuo, to Canon Kabushiki Kaisha. Image recorder with microwave fixation. 4,482,239, Cl. 355-3.0FU.
Hosoya, Kensei: *See*—
Kurosawa, Makoto; Nakano, Hiroshige; Hosoya, Kensei; and Kobayashi, Tsuneki, 4,481,880, Cl. 101-93.040.
Hottinger Baldwin Measurements, Inc.: *See*—
Laimins, Eric, 4,482,783, Cl. 177-147.000.
Hough, Harold L.: *See*—
Blaisdell, Ronald G.; Hough, Harold L.; and Martenson, Richard B., 4,482,942, Cl. 362-293.000.
Houkawa, Kouji; Ishida, Akira; and Okada, Masaru, to Nippon Telegraph & Telephone Public Corporation. Superconductive logic circuit. 4,482,821, Cl. 307-462.000.
Houminer, Yoram: *See*—
Williams, David L.; Southwick, Everett W.; and Houminer, Yoram, 4,481,957, Cl. 131-278.000.
Houston, Theodore W.: *See*—
Darley, Henry M.; Houston, Theodore W.; and Kruger, James B., 4,481,704, Cl. 29-571.000.
Hovel, Harold J.; and Rosenberg, Robert, to International Business Machines Corporation. Gallium aluminum arsenide integrated circuit structure using germanium. 4,482,906, Cl. 357-16.000.
Howell, David C. Reciprocating drafting pen. 4,481,713, Cl. 33-39.00B.
Howeth, D. Franklin. Self-cleaning air filter system. 4,482,367, Cl. 55-304.000.
Hrbas, Pavel: *See*—
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.
Hsieh, Benjamin C. B.; and Perugi, Archie H., to General Electric Company. Granular bed filtering device. 4,482,358, Cl. 48-77.000.
Hsu, Chao-Yang; and Lyons, James E., to Sun Tech, Inc. Production of hydroquinones. 4,482,756, Cl. 568-772.000.
Huang, Fu-chih; Jones, Howard; and Chan, Wan-Kit, to USV Pharmaceutical Corporation. Compounds for treating hypertension. 4,482,544, Cl. 424-177.000.
Huang, Tai-Nang; and Fernandez, Carlos G., to Olin Corporation. Catalyst for use in the hydrogenolysis of methyl glycol formals. 4,482,753, Cl. 568-678.000.

Huber, Guntram; Fischer, Wolfgang; Haeberle, Fritz; Kleiner, Horst; Riechers, Daniel; Klie, Wolfgang; and Tomforde, Johann, to Daimler-Benz Aktiengesellschaft. Bumper for motor vehicles. 4,482,180, Cl. 293-120.000.

Huber, Wolfgang: *See*—
Schiele, August; and Huber, Wolfgang. 4,481,860, Cl. 89-34.000.

Hubis, Daniel E.: *See*—
Bowman, Jeffery B.; Hubis, Daniel E.; Lewis, James D.; Newman, Stephen C.; and Staley, Richard A., 4,482,516, Cl. 264-127.000.

Hucks, Uwe: *See*—
Freitag, Dieter; Hucks, Uwe; and Meissner, Hans-Jurgen, 4,482,694, Cl. 528-176.000.

Hughes Aircraft Company: *See*—
Swaney, Richard E.; and Long, William D., 4,482,951, Cl. 364-200.000.

Hughes Helicopters, Inc.: *See*—
Price, Leonard W., 4,481,858, Cl. 89-11.000.

Hughes, Thomas R.: *See*—
Buss, Waldeen C.; and Hughes, Thomas R., 4,482,637, Cl. 502-37.000.

Hughes Tool Company: *See*—
Dibrell, Benton L.; and Gandy, Richard G., 4,482,379, Cl. 106-76.000.
McKenzie, Lee F., 4,482,383, Cl. 106-90.000.

Hulber, Loren J.; and Fluckiger, Raymond W., to Jostens, Inc. Hinge for thermoplastic material. 4,482,417, Cl. 156-219.000.

Humphrey, Cecil T. Dual frequency vibratory screen for classifying granular material. 4,482,455, Cl. 209-319.000.

Huntsberry, David L., to Microdot Inc. Carded goods merchandiser. 4,482,062, Cl. 211-57.100.

Hurlebaus, Richard P.; and Kiser, Herbert H., to Budd Company, The. Automatic electric welding system for maintaining uniform heat in a welding operation. 4,482,798, Cl. 219-137.710.

Hurtig, Roy E.: *See*—
Geri, Don W.; and Hurtig, Roy E., 4,482,333, Cl. 441-30.000.

Huruichi, Ryonosuke: *See*—
Yamazaki, Norio; Takaoka, Naoyoshi; Shinoki, Mikio; and Huruichi, Ryonosuke, 4,482,362, Cl. 55-62.000.

Hutschenreuther AG: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,482,515, Cl. 264-102.000.

Hydro Quebec: *See*—
Corbeil, Romain; Faubert, Jacques; and Trudeau, Marcel, 4,482,123, Cl. 248-542.000.

Hyun, Kyu H. Means for supplying fasteners in a tag attaching apparatus. 4,482,088, Cl. 227-67.000.

Iannelli, Frank M., to Gerlach Industries, Inc. Carbonating apparatus. 4,482,509, Cl. 261-64.00B.

Ichikawa, Masaru: *See*—
Kato, Hironobu; Ichikawa, Masaru; Sano, Atsushi; Tanabe, Yoshiaki; and Nakano, Yoshiyuki, 4,482,231, Cl. 354-246.000.

Ichimura, Yukio: *See*—
Oritsuki, Ryoji; Ichimura, Yukio; Kanai, Hiromi; and Shimada, Kenichi, 4,482,804, Cl. 250-211.00J.

ICI Americas Inc.: *See*—
Kruse, Walter M.; and Stephen, John F., 4,482,755, Cl. 568-730.000.

Idelman, Lloyd B.: *See*—
Dziedzic, Leo M.; Idelman, Lloyd B.; and Sobol, Lawrence M., 4,482,023, Cl. 180-89.170.

Idemitsu Kosan Company Limited: *See*—
Asahi, Satoshi; Mori, Shigeo; and Takeshita, Yasuhiro, 4,482,686, Cl. 526-119.000.

Ihira, Kuninosuke: *See*—
Unagami, Shigeyuki; Ihira, Kuninosuke; and Kaku, Takashi, 4,482,973, Cl. 364-602.000.

Iida, Katsuyoshi, to Mazda Motor Corporation. Closed-loop fuel control system for internal combustion engine. 4,481,908, Cl. 123-1.00A.

Ikeda, Chihiro, to Takeda Machinery Works Company, Ltd. Corner shear machine. 4,481,848, Cl. 83-693.000.

Ikeda, Sunao: *See*—
Hibi, Kunio; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,482,147, Cl. 271-229.000.

Ikegami, Akira: *See*—
Tanei, Hirayoshi; Iwanaga, Shoichi; Ikegami, Akira; Otsu, Hiroshi; and Isonae, Hiromi, 4,481,813, Cl. 73-336.500.

Ikejima, Hiroyuki: *See*—
Yoshida, Masayuki; Nomura, Masami; and Ikejima, Hiroyuki, 4,482,031, Cl. 187-29.00R.

Ikoma, Junichi: *See*—
Shimizu, Keizo; Takeda, Katunobu; Furuichi, Tokinori; Oguri, Masao; and Ikoma, Junichi, 4,482,992, Cl. 369-221.000.

Ikuzawa, Akira: *See*—
Fujii, Makoto; Ikuzawa, Akira; and Sullivan, Edward C., 4,482,579, Cl. 427-64.000.

Imado, Fumiaki: *See*—
Okada, Kazuo; and Imado, Fumiaki, 4,482,987, Cl. 369-44.000.

Imahori, Seiichi; Niwa, Toshio; Okada, Itaru; and Sato, Kuninori, to Mitsubishi Chemical Industries, Limited. N-(p-nitrophenyl)-N'-(4-amino-2-fluorotriazineamino phenyl)-1,4-disazophenylene dyes. 4,482,490, Cl. 534-797.000.

Imai, Akio: *See*—
Furukawa, Hiroshi; Saito, Yuichi; Imai, Akio; Yoshida, Nobuyuki; and Okamoto, Yasushi, 4,482,678, Cl. 525-236.000.

Imai, Masumi: *See*—
Amano, Matsuo; Sugawara, Toru; Furuhashi, Toshio; and Imai, Masumi, 4,482,962, Cl. 364-431.110.

Imai, Tamotsu, to UOP Inc. Process for production of alcohols and LPG. 4,482,767, Cl. 568-899.000.

Imazato, Minoru: *See*—
Kataoka, Kenzo; and Imazato, Minoru, 4,482,320, Cl. 433-69.000.

Impakt Products, Inc.: *See*—
Whelan, John W., 4,483,018, Cl. 383-5.000.

Imperial Chemical Industries Limited: *See*—
Jennings, James R.; and Pessimisis, George N., 4,482,645, Cl. 502-316.000.

Imperial Chemical Industries PLC: *See*—
Palgrave, Derek A.; Waite, Frederick A.; Birchall, James D.; Cooper, John; and Enever, James A., 4,482,372, Cl. 71-35.000.

Imperial Clevite Inc.: *See*—
Maldavs, Ojars, 4,481,977, Cl. 138-89.400.

Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, to Fujitsu Fanuc Limited. Robot hand of an industrial robot. 4,482,289, Cl. 414-736.000.

Inaba, Hajimu; and Sakakibara, Shinsuke, to Fanuc Ltd. Method and apparatus for robot control. 4,482,968, Cl. 364-513.000.

Inaba, Humio; Ito, Hiromasa; and Ogawa, Yoh, to Tohoku University. Laser functional device. 4,483,004, Cl. 372-8.000.

Inada, Takhi. Door lock. 4,481,798, Cl. 70-349.000.

Inai, Toshimi: *See*—
Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,482,420, Cl. 156-392.000.

Inai, Yuichi: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Inai, Yuichi; Suzuki, Yoshikazu; and Tagaya, Osamu, 4,482,734, Cl. 560-104.000.

Indeherbergh, Jean; and Nicolas, Edgard, to Solvay & Cie. Permeable diaphragm, made from a hydrophobic organic polymeric material, for a cell for the electrolysis of aqueous solutions of an alkali metal halide. 4,482,441, Cl. 204-128.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Cantello, Giuseppe, 4,482,851, Cl. 318-696.000.

Ingenior F. Selmer A/S: *See*—
Einstabland, Tomas B.; and Olsen, Olav, 4,481,899, Cl. 114-264.000.

Ingraffea, Anthony R., to Cornell Research Foundation, Inc. Hand held, direct reading, fully mechanical fracture loading device for short rod/bar specimens. 4,481,826, Cl. 73-799.000.

INMAC: *See*—
Willenborg, James F., 4,482,200, Cl. 339-103.00M.

Inoue, Takayoshi: *See*—
Tsukahara, Kenji; Mutsukura, Kouji; and Inoue, Takayoshi, 4,481,921, Cl. 123-304.000.

Inoue, Tokuta: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,915, Cl. 123-188.00M.
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,916, Cl. 123-188.00M.

Inoue, Tomoaki: *See*—
Yoneyama, Takao; Satoh, Ichiya; Obara, Sanshiro; Inoue, Tomoaki; and Koga, Tsuguaki, 4,481,819, Cl. 73-593.000.

Institutul De Cercetare Stiintifica, Inginerie Tehnologica Si Proiectare Pentru Sectoare Calde: *See*—
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, 4,482,376, Cl. 75-10.00R.

Instrument Flight Research Inc.: *See*—
Witt, Frank, 4,482,326, Cl. 434-36.000.

International Business Machines Corporation: *See*—
Beck, John L.; Bornhorst, Randy J.; Smith, Donald J.; and Zell, Michael N., 4,482,929, Cl. 360-133.000.
Crauwels, Guy L., 4,482,887, Cl. 340-347.0DA.
Groom, Jay L., Jr.; Smith, Patricia J.; and Vair, Gary G., 4,483,002, Cl. 371-29.000.
Hiraoka, Hiroyuki, 4,482,427, Cl. 156-643.000.
Hovel, Harold J.; and Rosenberg, Robert, 4,482,906, Cl. 357-16.000.
Janson, Philippe A.; Mueller, Hans R.; and Sze, Daniel T. W., 4,482,999, Cl. 370-86.000.
Orengo, Gerard, 4,482,815, Cl. 307-44.000.
Oza, Bharat J.; and Roche, Thomas J., 4,482,819, Cl. 307-269.000.
Rigby, Eugene B., 4,482,418, Cl. 156-276.000.
Ryan, Philip M., 4,483,001, Cl. 371-11.000.
Tallman, Peter H., 4,482,956, Cl. 364-300.000.

International Cyclo-Crane Licensing, A Virginia Partnership: *See*—
Crimmins, Arthur G., Jr., 4,482,110, Cl. 244-26.000.

International Flavors & Fragrances Inc.: *See*—
Klemarczyk, Philip T., 4,482,747, Cl. 568-376.000.

International Harvester Co.: *See*—
Dziedzic, Leo M.; Idelman, Lloyd B.; and Sobol, Lawrence M., 4,482,023, Cl. 180-89.170.

International Playtex, Inc.: *See*—
Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, 4,481,951, Cl. 128-516.000.

International Robomation/Intelligence: *See*—
Goshorn, Lawrence A.; and Bradley, C. Earl, 4,481,768, Cl. 60-327.000.

International Telephone and Telegraph Corporation: *See*—
Young, Kenneth P.; Tyler, Derek E.; Cheskis, Harvey P.; and Watson, W. Gary, 4,482,012, Cl. 165-146.000.

Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Cowie, William P.; Lawrence, Drummond M. P.; and Goodlad, Morgan H., 4,481,693, Cl. 17-46.000.

Iowa Manufacturing Company of Cedar: *See*—
Musil, Joseph E., 4,482,281, Cl. 414-332.000.

Irie, Toshio: *See*—
Matsumoto, Yoshihiro; Shinozaki, Masatoshi; and Irie, Toshio, 4,482,600, Cl. 428-213.000.

Ironside, John M.; Deller, Nigel A.; Sainsbury, Clive R.; and Weston, Paul, to Lucas Industries Limited. Transmission system. 4,481,844, Cl. 74-866.000.

Irvin Industries, Inc.: *See*—
Gavagan, James A.; Petersen, Carl M., III; and Ray, Michael J., 4,482,137, Cl. 267-157.000.

Irving, Edward, to Ciba-Geigy Corporation. Heat-curable epoxy compositions containing diaryliodosyl salts. 4,482,679, Cl. 525-327.300.

Isaka, Kazuo: *See*—
Hosono, Nagao; and Isaka, Kazuo, 4,482,239, Cl. 355-3.0FU.

Isbrandt, Russell R., to Minnesota Mining and Manufacturing Company. Release coating for infrared imageable and thermally imageable films. 4,482,608, Cl. 428-421.000.

Ishiba, Teruyuki: *See*—
Hirai, Kentaro; Ishiba, Teruyuki; Matsutani, Shigeru; Makino, Itsuo; Fujishita, Toshio; Doeteuchi, Masami; and Otani, Koichi, 4,482,566, Cl. 424-274.000.

Ishibashi, Kenzo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Device for detecting stop value data from flash unit used with camera. 4,482,237, Cl. 354-416.000.

Ishida, Akira: *See*—
Houkawa, Kouji; Ishida, Akira; and Okada, Masaru, 4,482,821, Cl. 307-462.000.

Ishida, Hiroshi: *See*—
Kawada, Shigeki; Ishida, Hiroshi; and Kouno, Shinichi, 4,482,854, Cl. 318-801.000.

Ishida, Takashi; and Hamada, Kazutaka, to Nissan Motor Company, Limited. MacPherson strut front suspension. 4,482,135, Cl. 267-8.00R.

Ishida, Tokuzi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Accelerator pump system for carburetors. 4,481,914, Cl. 123-179.00G.

Ishii, Junichi: *See*—
Kubota, Jun; Ishii, Junichi; and Sasaki, Soji, 4,481,822, Cl. 73-625.000.

Ishii, Masaji; Hagiwara, Hirotoshi; and Hiraoka, Hideo, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermionic emission cathode. 4,482,838, Cl. 313-336.000.

Ishii, Masaji: *See*—
Wada, Tetsuya; Ishii, Masaji; Miyai, Akira; and Hagiwara, Hirotoshi, 4,482,839, Cl. 313-346.00R.

Ishii, Taiji; and Tarutani, Takashi, to Dai Nippon Insatsu Kabushiki Kaisha. Transfer sheets and production of decorative articles therewith. 4,482,598, Cl. 428-195.000.

Ishii, Takatoshi: *See*—
Amano, Katsumi; and Ishii, Takatoshi, 4,482,955, Cl. 364-200.000.

Ishii, Takeshi: *See*—
Ushio, Masaru; Morita, Toru; Ishii, Takeshi; and Oishi, Yasuyuki, 4,482,450, Cl. 208-152.000.

Ishikawa, Hiroyuki, to Casio Computer Co., Ltd. Voice data output apparatus for electronic cash registers. 4,482,976, Cl. 364-710.000.

Ishikawa, Hisao: *See*—
Iwataki, Isao; Nakayama, Akira; Kaeriyama, Minoru; Ishikawa, Hisao; Hosaka, Hideo; Kohara, Kenichi; and Yamada, Shozo, 4,482,740, Cl. 564-99.000.

Ishikawa, Nobuo; and Nakai, Takeshi, to Daikin Kogyo Co., Ltd. Fluoroalkyl silyl ketene acetals and a process for preparing the same. 4,482,729, Cl. 556-446.000.

Ishikawa, Shigeta, to Nippon Electric Co., Ltd. Optical multiplexer/demultiplexer using interference filters. 4,482,994, Cl. 370-3.000.

Ishikawa, Tomohisa, to Caso Computer Co., Ltd. Electronic keyboard musical instrument capable of inputting rhythmic patterns. 4,481,853, Cl. 84-1.030.

Ishitani, Kenichiro; Hamasaki, Toshiharu; Shiomi, Shoji; and Kawamura, Eiichi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Eagle Industry Co., Ltd. Stern tube seal device. 4,482,158, Cl. 277-3.000.

Ishitani, Kenichiro; and Kawamura, Eiichi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Eagle Industry Co., Ltd. Stern tube seal device. 4,482,159, Cl. 277-3.000.

Ishiwatari, Shiro, to Olympus Optical Co., Ltd. Sealing aid for fastening a resilient plug inserted into an opening of a container. 4,482,071, Cl. 215-255.000.

Isii, Yosio: *See*—
Shigeta, Masatomo; Isii, Yosio; and Hoshi, Akio, 4,482,452, Cl. 208-177.000.

Iso, Tadashi: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,482,709, Cl. 536-46.000.

Isoguchi, Seiichi: *See*—
Shiozawa, Kazuo; and Isoguchi, Seiichi, 4,482,227, Cl. 354-173.110.

Isonae, Hiromi: *See*—
Tanei, Hirayoshi; Iwanaga, Shoichi; Ikegami, Akira; Otsu, Hiroshi; and Isonae, Hiromi, 4,481,813, Cl. 73-336.500.

Ito, Hiromasa: *See*—
Inaba, Humio; Ito, Hiromasa; and Ogawa, Yoh, 4,483,004, Cl. 372-8.000.

Ito, Nobuaki: *See*—
Akimoto, Ryosaku; and Ito, Nobuaki, 4,481,789, Cl. 62-209.000.

Ito, Satoru: *See*—
Matsumoto, Masakatsu; and Ito, Satoru, 4,482,493, Cl. 260-396.00R.

Ito, Yasunori: *See*—
Makabe, Hideki; Yamamoto, Toyoji; Matsueda, Yoshio; Ito, Yasunori; and Yamada, Katsuto, 4,482,245, Cl. 356-30.000.

Ito, Yukinobu: *See*—
Nakayama, Nobutoshi; Ito, Yukinobu; Nishihara, Eitaro; Iwata, Kazuhide; and Shibayama, Shigeki, 4,482,958, Cl. 364-414.000.

Itoh, Kiyoo; and Hori, Ryoichi, to Hitachi, Ltd. Semiconductor integrated circuit. 4,482,985, Cl. 365-226.000.

ITT Industries, Inc.: *See*—
Alexander, John H., 4,482,933, Cl. 361-321.000.
Bechi, Reimund; and Bohm, Peter, 4,481,865, Cl. 91-369.00A.
Burgdorf, Jochen; and Birkenbach, Alfred, 4,482,190, Cl. 303-6.00R.
Heinecke, Rudolf A. H., 4,482,394, Cl. 148-1.500.
Wheeler, Jennifer M., 4,482,935, Cl. 361-321.000.

Itzinger, Hermann: *See*—
Wossner, Felix; Axthammer, Ludwig; Heyer, Gunther; and Itzinger, Hermann, 4,482,036, Cl. 188-322.130.

Ivanov, Eduard E.: *See*—
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; and Chicherin, Jury E., 4,482,950, Cl. 364-200.000.

Iverson, Jacob E. Regulator-unloader for high pressure spraying equipment. 4,481,968, Cl. 137-116.000.

Iwaki, Yoshiyuki; and Matsumoto, Akio, to Mitsubishi Denki Kabushiki Kaisha. Electric generator for vehicle. 4,482,830, Cl. 310-113.000.

Iwamoto, Yogaku: *See*—
Nakamura, Tadamitsu; Iwamoto, Yogaku; Kadotani, Kanichi; and Marui, Tokuo, 4,482,467, Cl. 252-70.000.

Iwanaga, Shoichi: *See*—
Tanei, Hirayoshi; Iwanaga, Shoichi; Ikegami, Akira; Otsu, Hiroshi; and Isonae, Hiromi, 4,481,813, Cl. 73-336.500.

Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, to Santen Pharmaceutical Co., Ltd. Inclusion compounds of cyclodextrin with sulfur-containing compounds. 4,482,709, Cl. 536-46.000.

Iwasaki, Hideo: *See*—
Mito, Yasuhiro; and Iwasaki, Hideo, 4,482,966, Cl. 364-498.000.

Iwata, Kazuhide: *See*—
Nakayama, Nobutoshi; Ito, Yukinobu; Nishihara, Eitaro; Iwata, Kazuhide; and Shibayama, Shigeki, 4,482,958, Cl. 364-414.000.

Iwataki, Isao; Nakayama, Akira; Kaeriyama, Minoru; Ishikawa, Hisao; Hosaka, Hideo; Kohara, Kenichi; and Yamada, Shozo, to Nippon Soda Company Limited. 5-Phenylcyclohexenone derivatives. 4,482,740, Cl. 564-99.000.

Izzi, Lewis B., Sr., to Plastic Oddities, Inc. Toilet bowl gasket of rubberlike material having compressible concentric ridge rings on both sides. 4,482,161, Cl. 277-207.00A.

J. M. Ney Company, The: *See*—
Schaffer, Stephen P., 4,482,323, Cl. 433-207.000.

J. T. Baker Chemical Company: *See*—
Ward, Irl E., 4,482,591, Cl. 428-66.000.

Jaccard, Pierre-Ernest: *See*—
Gygax, Claude-Andre ; Jaccard, Pierre-Ernest; and Jaunin, Jean-Pierre, 4,482,255, Cl. 368-10.000.

Jackowicz, Stanley E., to Park-Ohio Industries, Inc. Transformer core cooling arrangement. 4,482,879, Cl. 336-55.000.

Jacobs, Daryl E. Flowerpot. 4,481,733, Cl. 47-71.000.

Jacobson, Allan J.: *See*—
Beyerlein, Robert A.; Jacobson, Allan J.; and Poeppelmeier, Kenneth R., 4,482,644, Cl. 502-303.000.

Jacobson, Irvin D.; Volgstadt, Frank R.; and Passerell, Carl E., to Perfection Corporation. Gas riser apparatus. 4,482,170, Cl. 285-55.000.

Jacoby, George V.: *See*—
Melbye, Hartvig E.; and Jacoby, George V., 4,482,927, Cl. 360-40.000.

Jacquet, Maurice, to Valeo. Case for housing a heat exchanger, in particular for a heater installation for the passenger space of a motor vehicle. 4,482,011, Cl. 165-67.000.

Jacquet, Sten F., to Carex Process AB. Filtering apparatus. 4,482,457, Cl. 210-270.000.

Jagid, Bruce: *See*—
Rosansky, Martin G.; and Jagid, Bruce, 4,482,615, Cl. 429-94.000.

Jalovec, Lee J.; and Andrews, Roland E., to Tektronix, Inc. Waveform measurement and display apparatus. 4,482,861, Cl. 324-77.00B.

JAM Ind., Ltd.: *See*—
Dugas, Paul, 4,481,854, Cl. 84-1.190.

James Burn Bindings Limited: *See*—
Jones, Leonard W. N.; Kandlekar, Samuel D.; and Archer, Derek J., 4,482,279, Cl. 412-39.000.

James River Corporation, The: *See*—
Johnson, Jeffrey J., 4,482,308, Cl. 425-83.100.

James River-Dixie/Northern, Inc.: *See*—
Kuchenbecker, Morris W., 4,482,079, Cl. 221-310.000.
Pawlowski, Thomas D.; and Vaxmonsky, Joseph J., 4,482,080, Cl. 221-310.000.

James River Graphics, Inc.: *See*—
DiPippo, Carmine A., 4,482,489, Cl. 534-556.000.

James River-Norwalk, Inc.: *See*—
Klowak, Bernard G., 4,482,429, Cl. 162-111.000.

James, Robert B., Jr.: *See*—
Carson, Don B.; and James, Robert B., Jr., 4,482,369, Cl. 62-18.000.

Janson, Philippe A.; Mueller, Hans R.; and Sze, Daniel T. W., to International Business Machines Corporation. Method of transmitting information between stations attached to a unidirectional transmission ring. 4,482,999, Cl. 370-86.000.

Japan Atomic Energy Research Institute: *See*—
Tominaga, Hiroshi; Sase, Yoshihiro; and Horiuchi, Shoichi, 4,482,808, Cl. 250-392.000.
Japan Bano'k Co., Ltd.: *See*—
Furutsu, Akira, 4,482,087, Cl. 227-67.000.
Japan Elastomer Co., Ltd.: *See*—
Teranaka, Osamu; Kakutani, Tsutomu; Tabata, Haruro; and Teraoka, Tutomu, 4,482,677, Cl. 525-250.000.
Japan Polypro Backing Co. Ltd.: *See*—
Fujishita, Kusuo; Sakamoto, Hideshi; Yamazawa, Tomio; and Yamaguchi, Junichi, 4,482,595, Cl. 428-95.000.
Jarvis, H. Frank. Agricultural share formed in two mirror image parts. 4,482,020, Cl. 172-726.000.
Jarvis, Roger P.; and Windsor, Harry M., to Automotive Products Limited. Automatic transmission. 4,481,843, Cl. 74-866.000.
Jastrzebski, Lubomir L.: *See*—
McGinn, Joseph T.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,482,422, Cl. 156-612.000.
Jaunin, Jean-Pierre: *See*—
Gygax, Claude-Andre ; Jaccard, Pierre-Ernest; and Jaunin, Jean-Pierre, 4,482,255, Cl. 368-10.000.
Javdani, Kambiz; and Welch, William J., to Stauffer Chemical Company. Method for preparation of 8-methoxy-4,8-dimethyl-1-(4-isopropylphenyl)-nonane. 4,482,751, Cl. 568-626.000.
Jay, Paul R., to Thomson-CSF. Planar-type field-effect transistor having metallized-well electrodes and a method of fabrication of said transistor. 4,482,907, Cl. 357-22.000.
Jellen, Stephen F. System and method for constructing walls and foundations employing structural components. 4,481,743, Cl. 52-64.000.
Jencks, Charles L.: *See*—
Castonguay, Roger N.; and Jencks, Charles L., 4,482,877, Cl. 335-191.000.
Jennings, James R.; and Pessimisis, George N., to Imperial Chemical Industries Limited; and Katalco Corporation. Method of making an iron oxidechromium oxide catalyst. 4,482,645, Cl. 502-316.000.
Jens, Yan H.: *See*—
Marchand, Maurice; and Jens, Yan H., 4,482,867, Cl. 330-277.000.
Jensen, Sigbjorn: *See*—
Tengesdal, Paul; and Jensen, Sigbjorn, 4,481,747, Cl. 52-460.000.
Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Ventilating skywindow. 4,481,735, Cl. 49-325.000.
Jidoshi Kiki Co., Ltd.: *See*—
Yanagi, Kunio; and Andoh, Munesato, 4,482,160, Cl. 277-12.000.
Jirkovsky, Ivo: *See*—
Santroch, George; and Jirkovsky, Ivo, 4,482,714, Cl. 544-343.000.
Johansson, Kent A., to Victor Hasselblad Aktie Bolag. Compensation device at projectors with exchangeable and vertically movable lenses. 4,482,224, Cl. 353-101.000.
Johnson, James J., to General Motors Corporation. Door handle assembly. 4,482,179, Cl. 292-336.300.
Johnson, Jeffrey J., to James River Corporation, The. Apparatus for forming dry laid webs. 4,482,308, Cl. 425-83.100.
Johnson, Milo R.: *See*—
Tiku, Shiban K.; and Johnson, Milo R., 4,482,841, Cl. 313-503.000.
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., to Eli Lilly and Company. Antibiotic A53868 and process for production thereof. 4,482,488, Cl. 260-112.50R.
Johnson Service Company: *See*—
Rudich, George, Jr.; Beeson, Charles F.; and Bartley, Gary L., 4,482,847, Cl. 318-9.000.
Johnson, Steven M., to Federal-Mogul Corporation. Mechanical devices for chemical treatment of fluids. 4,482,462, Cl. 210-752.000.
Joll, David J.: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,481,872, Cl. 99-353.000.
Jones, Howard: *See*—
Huang, Fu-chih; Jones, Howard; and Chan, Wan-Kit, 4,482,544, Cl. 424-177.000.
Jones, Leonard W. N.; Kandlekar, Samuel D.; and Archer, Derek J., to James Burn Bindings Limited. Binding machines. 4,482,279, Cl. 412-39.000.
Jones, Linda E.: *See*—
Stephens, William D.; and Jones, Linda E., 4,482,410, Cl. 149-19.400.
Stephens, William D.; and Jones, Linda E., 4,482,411, Cl. 149-19.400.
Jones, Richard A.: *See*—
Gardner, Keith L.; and Jones, Richard A., 4,482,684, Cl. 526-84.000.
Jones, William W.: *See*—
Kelley, Charles K.; and Jones, William W., 4,482,294, Cl. 415-219.00R.
Jonsson, Gunther: *See*—
Sikander, Ake; Bjorkman, Ake; and Jonsson, Gunther, 4,481,889, Cl. 110-212.000.
Jorgensen, Robert J.: *See*—
Noshay, Allen; Karol, Frederick J.; and Jorgensen, Robert J., 4,482,687, Cl. 526-125.000.
Jost, Karel: *See*—
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.
Jostens, Inc.: *See*—
Hulber, Loren J.; and Fluckiger, Raymond W., 4,482,417, Cl. 156-219.000.
Joy Manufacturing Company: *See*—
Golobic, Robert A.; and Prosper, Lawrence J., 4,482,253, Cl. 366-147.000.
Julien, Paul C.: *See*—
Gruber, Robert J.; Julien, Paul C.; and Yourd, Raymond A., III, 4,482,620, Cl. 430-99.000.
Jung, Eggert: *See*—
Gaulke, Werner; and Jung, Eggert, 4,482,917, Cl. 358-80.000.
Jurd, Leonard, to United States of America, Agriculture. Polybutylbenzylphenols and benzyl-3,4-methylenedioxbenzenes in insect population control. 4,482,728, Cl. 549-435.000.
Just, Christoph; Ritz, Jurgen; and Zimmermann, Rolf, to Hoechst Aktiengesellschaft. Water-dilutable binder, a process for its preparation and its use. 4,482,674, Cl. 525-124.000.
K. S. Macey Machine Company, Inc.: *See*—
Macey, Keith S., 4,482,140, Cl. 270-53.000.
Kabashima, Katsuhiko: *See*—
Nozaki, Shigeki; Takemae, Yoshihiro; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,482,825, Cl. 307-578.000.
Kabel-und Metalwerke Gutehoffnungshuette AG: *See*—
Schleese, Eckhardt; Gessner, Rudolf; and Manke, Horst, 4,482,412, Cl. 156-51.000.
Kabushiki Kaisah Kitamuragokin Seisakusho: *See*—
Takeshita, Shigeo; and Kitamura, Yoshiaki, 4,481,891, Cl. 110-238.000.
Kabushiki Kaisha Isshin Kenkyusho: *See*—
Sugie, Syuichi, 4,482,175, Cl. 292-45.000.
Kabushiki-Kaisha Kodera Seisakusho: *See*—
Kodera, Yasuji, 4,482,264, Cl. 403-58.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nagahara, Yoshikazu, 4,481,769, Cl. 60-441.000.
Nakamura, Tadamitsu; Iwamoto, Yogaku; Kadotani, Kanichi; and Marui, Tokuo, 4,482,467, Cl. 252-70.000.
Sugito, Hiroshi; and Kasuya, Tamotsu, 4,481,773, Cl. 60-606.000.
Kabushiki Kaisha Meidensha: *See*—
Miyagawa, Hiroshi; and Kano, Masayuki, 4,482,790, Cl. 200-144.00B.
Kabushiki Kaisha Morita Seisakusho: *See*—
Kataoka, Kenzo; and Imazato, Minoru, 4,482,320, Cl. 433-69.000.
Kabushiki Kaisha Teikoku Denki Seisakusho: *See*—
Tsukamoto, Masuya, 4,481,781, Cl. 62-55.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kurushima, Tadanori; Yoshida, Yoshiaki; and Kamiya, Kazuo, 4,481,765, Cl. 57-412.000.
Kurushima, Tadanori; Takeshita, Kiyoshi; and Kamiya, Kazuo, 4,481,766, Cl. 57-417.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Sakata, Jiro; Hirai, Masana; and Yamamoto, Minoru, 4,481,808, Cl. 73-61.10R.
Kadija, Igor V., to Olin Corporation Electrochemical cell and process for manufacturing temperature sensitive solutions. 4,482,440, Cl. 204-105.00R.
Kadotani, Kanichi: *See*—
Nakamura, Tadamitsu; Iwamoto, Yogaku; Kadotani, Kanichi; and Marui, Tokuo, 4,482,467, Cl. 252-70.000.
Kaeriyama, Minoru: *See*—
Iwataki, Isao; Nakayama, Akira; Kaeriyama, Minoru; Ishikawa, Hisao; Hosaka, Hideo; Kohara, Kenichi; and Yamada, Shozo, 4,482,740, Cl. 564-99.000.
Kai, Yasuhito: *See*—
Nishimura, Masao; Mori, Masami; and Kai, Yasuhito, 4,482,009, Cl. 165-41.000.
Kaiser, Roman; and Lamparsky, Dietmar, to Givaudan Corporation. Odorant and/or flavoring substances. 4,482,762, Cl. 368-840.000.
Kakitani, Yohtaro: *See*—
Hibi, Kunio; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,482,147, Cl. 271-229.000.
Kaku, Takashi: *See*—
Unagami, Shigeyuki; Ihira, Kuninosuke; and Kaku, Takashi, 4,482,973, Cl. 364-602.000.
Kakutani, Nobuyasu: *See*—
Tateishi, Iwao; Mizuta, Takemi; Yokoyama, Tatuo; and Kakutani, Nobuyasu, 4,482,965, Cl. 364-467.000.
Kakutani, Tsutomu: *See*—
Teranaka, Osamu; Kakutani, Tsutomu; Tabata, Haruro; and Teraoka, Tutomu, 4,482,677, Cl. 525-250.000.
Kali-Chemie Pharma GmbH: *See*—
Roemer, Dietmar; Ruhland, Michael; Zeugner, Horst; Milkowski, Wolfgang; and Liepmann, Hans, 4,482,548, Cl. 424-244.000.
Kalinowski, James E.: *See*—
Rutten, Peter T.; and Kalinowski, James E., 4,481,900, Cl. 114-311.000.
Kallfass, Traugott: *See*—
Luder, Ernst; Kallfass, Traugott; and Borgwardt, Christian, 4,482,882, Cl. 338-34.000.
Kalnew Optical Industrial Co., Ltd.: *See*—
Makabe, Hideki; Yamamoto, Toyoji; Matsueda, Yoshio; Ito, Yasunori; and Yamada, Katsuto, 4,482,245, Cl. 356-30.000.
Kamata, Yoshikiyo: *See*—
Fukuoka, Takashi; and Kamata, Yoshikiyo, 4,482,028, Cl. 181-240.000.
Kamiya, Kazuo: *See*—
Kurushima, Tadanori; Yoshida, Yoshiaki; and Kamiya, Kazuo, 4,481,765, Cl. 57-412.000.

Kurushima, Tadanori; Takeshita, Kiyoshi; and Kamiya, Kazuo, 4,481,766, Cl. 57-417.000.
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, to Hitachi, Ltd. Process for treating waste gas in reprocessing of used nuclear fuel. 4,482,479, Cl. 252-630.000.
Kamohara, Eiji: *See*—
Ohtake, Yasuhisa; Seino, Kazuyuki; and Kamohara, Eiji, 4,482,334, Cl. 445-47.000.
Kamoshita, Katsuzo: *See*—
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,482,546, Cl. 424-211.000.
Kamuro, Setsufumi; and Masaki, Yoshifumi, to Sharp Kabushiki Kaisha. Semiconductor chip selection circuit having programmable level control circuitry using enhancement/depletion-mode MOS devices. 4,482,822, Cl. 307-468.000.
Kanai, Hiromi: *See*—
Oritsuki, Ryoji; Ichimura, Yukio; Kanai, Hiromi; and Shimada, Kenichi, 4,482,804, Cl. 250-211.00J.
Kanasugi, Mikiko: *See*—
Kaneko, Kazuo; Obara, Toshio; Gonda, Michihiro; Kickawa, Katsumasa; and Kanasugi, Mikiko, 4,482,905, Cl. 346-207.000.
Kanatani, Kenji: *See*—
Habata, Etsuroh; Ohshima, Nobumasa; and Kanatani, Kenji, 4,482,801, Cl. 219-540.000.
Kanayama, Hisayasu; Sasaki, Yoshiaki; Furuno, Naoki; Sasaoka, Yoshitaka; and Tokita, Osamu, to Nippon Kokan Kabushiki Kaisha. Pouring repair material for mortar or the like wall. 4,482,382, Cl. 106-90.000.
Kanda, Mutsumi: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,915, Cl. 123-188.00M.
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,916, Cl. 123-188.00M.
Kandlekar, Samuel D.: *See*—
Jones, Leonard W. N.; Kandlekar, Samuel D.; and Archer, Derek J., 4,482,279, Cl. 412-39.000.
Kandler, Joachim; and Wolter, Manfred, to Hoechst Aktiengesellschaft. Process for removing carbon black from aqueous suspensions. 4,482,460, Cl. 210-706.000.
Kaneko, Kazuo; Obara, Toshio; Gonda, Michihiro; Kickawa, Katsumasa; and Kanasugi, Mikiko, to Hodogaya Chemical Co., Ltd. Heat sensitive record material. 4,482,905, Cl. 346-207.000.
Kaneko, Shinji, to Tokico Ltd. Ball joint. 4,482,266, Cl. 403-135.000.
Kaneko, Tamaki: *See*—
Hibi, Kunio; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,482,147, Cl. 271-229.000.
Kano, Masayuki: *See*—
Miyagawa, Hiroshi; and Kano, Masayuki, 4,482,790, Cl. 200-144.00B.
Kano, Osamu: *See*—
Hirota, Toshiharu; Kano, Osamu; and Kato, Yoshiharu, 4,482,934, Cl. 361-321.000.
Kanzaka, Yoshihiro, to Yoshida Kogyo K.K. Snap-fit button. 4,481,696, Cl. 24-113.00R.
Kao, Tsung-chung: *See*—
Mitchell, James K.; and Kao, Tsung-chung, 4,482,271, Cl. 405-157.000.
Kaplan, Joel H.; and Kinstler, Robert C., to American Cyanamid Company. Continuous process for preparing benzothiazyl disulfide. 4,482,720, Cl. 548-158.000.
Karau, Philip A.; Littrell, Marshall W.; and Brooks, John S., to General Motors Corporation. Internal combustion engine spark timing control including peak combustion sensor. 4,481,925, Cl. 123-425.000.
Karim, Karl A., to Shell Oil Company. Smooth-look footwear process. 4,482,428, Cl. 156-668.000.
Karl, Walter, to Utilux Pty. Limited. Electrical contact. 4,482,199, Cl. 339-74.00R.
Karlsson, Jorgen B., to Saab Training Systems Aktiebolag. Target device. 4,482,156, Cl. 273-406.000.
Karol, Frederick J.: *See*—
Noshay, Allen; Karol, Frederick J.; and Jorgensen, Robert J., 4,482,687, Cl. 526-125.000.
Karol, Thomas J.; Schlicht, Raymond C.; and Magaha, Harold S., to Texaco Inc. Hydrocarbyl-substituted mono- and bis-succinimide having polyamine chain linked hydroxyacyl radicals and mineral oil compositions containing same. 4,482,464, Cl. 252-51.50A.
Karonen, Aimo: *See*—
Hirvonen, Kullervo; and Karonen, Aimo, 4,482,250, Cl. 356-369.000.
Karpiak, Stephen E.: *See*—
Tamir, Hadassah; Karpiak, Stephen E.; and Wilchek, Meir, 4,482,567, Cl. 424-274.000.
Karrer, H. Edward: *See*—
Dias, J. Fleming; Karrer, H. Edward; Larson, John D., III; Wilson, David A.; and Hanafy, Amin M., 4,482,834, Cl. 310-327.000.
Kashiwagi, Michio, to Toray Industries, Inc. Two-component type dry developer. 4,482,621, Cl. 430-107.000.
Kastner, Ralph M.: *See*—
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., 4,482,488, Cl. 260-112.50R.
Kasuya, Tamotsu: *See*—
Sugito, Hiroshi; and Kasuya, Tamotsu, 4,481,773, Cl. 60-606.000.
Katalco Corporation: *See*—
Jennings, James R.; and Pessimisis, George N., 4,482,645, Cl. 502-316.000.
Kataoka, Keisuke: *See*—
Sagara, Iwao; and Kataoka, Keisuke, 4,482,787, Cl. 179-90.00D.
Kataoka, Kenzo; and Imazato, Minoru, to Kabushiki Kaisha Morita Seisakusho. Face bow of the mandibular motion diagnostic device. 4,482,320, Cl. 433-69.000.
Kato, Hironobu; Ichikawa, Masaru; Sano, Atsushi; Tanabe, Yoshiaki; and Nakano, Yoshiyuki, to Nippon Kogaku K.K. Light-intercepting blade for a light control device. 4,482,231, Cl. 354-246.000.
Kato, Kentaro: *See*—
Matsuda, Minoru; Shinozaki, Takashi; and Kato, Kentaro, 4,482,024, Cl. 180-219.000.
Kato, Toshiro: *See*—
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,482,546, Cl. 424-211.000.
Kato, Yoshiharu: *See*—
Hirota, Toshiharu; Kano, Osamu; and Kato, Yoshiharu, 4,482,934, Cl. 361-321.000.
Katsube, Junki: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,482,573, Cl. 424-327.000.
Katsura, Toru; and Kubbota, Massashi, to Mitsubishi Paper Mills, Ltd. Photographic paper containing magnesium oxide. 4,482,628, Cl. 430-538.000.
Katzir, Abraham; and Kolodner, Paul R., to AT&T Bell Laboratories. Method for monitoring etching of resists by monitoring the flouresence of the unetched material. 4,482,424, Cl. 156-626.000.
Kawada, Shigeki; Ishida, Hiroshi; and Kouno, Shinichi, to Fanuc Ltd. Inverter circuit. 4,482,854, Cl. 318-801.000.
Kawado, Yashuhumi: *See*—
Morishita, Tuyoshi; Hattori, Toshihiko; Kawado, Yashuhumi; and Tarumoto, Kouji, 4,482,399, Cl. 148-31.500.
Kawagoe, Nobukazu: *See*—
Yuasa, Yoshio; Naruse, Kazuhiko; and Kawagoe, Nobukazu, 4,482,978, Cl. 364-900.000.
Kawai, Osamu: *See*—
Sano, Yasumasa; and Kawai, Osamu, 4,482,103, Cl. 242-107.200.
Kawakami, Hajime: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,482,573, Cl. 424-327.000.
Kawakami, Hidenori: *See*—
Ohta, Yoshihiro; Kawakami, Hidenori; and Tsuruta, Keiji, 4,482,880, Cl. 336-217.000.
Kawamoto, Kiyoaki: *See*—
Yamazaki, Yoshio; Kawamoto, Kiyoaki; and Kawata, Shun, 4,482,244, Cl. 355-15.000.
Kawamura, Eiichi: *See*—
Ishitani, Kenichiro; Hamasaki, Toshiharu; Shiomi, Shoji; and Kawamura, Eiichi, 4,482,158, Cl. 277-3.000.
Ishitani, Kenichiro; and Kawamura, Eiichi, 4,482,159, Cl. 277-3.000.
Kawamura, Ichiro; Hino, Izumi; and Fujita, Makoto, to Matsushita Electric Industrial Co., Ltd. Disk recording and reproducing device. 4,482,991, Cl. 369-77.200.
Kawamura, Kiyoshi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Takada, Toshiyuki; and Yamamoto, Hitoshi, 4,481,909, Cl. 123-73.0CC.
Kawasaki, Keiichi: *See*—
Yuguchi, Naoki; and Kawasaki, Keiichi, 4,483,014, Cl. 378-173.000.
Kawasaki Steel Corporation: *See*—
Matsumoto, Yoshihiro; Shinozaki, Masatoshi; and Irie, Toshio, 4,482,600, Cl. 428-213.000.
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.
Kawasaki, Tetsuo: *See*—
Nagase, Yukihiko; Kawasaki, Tetsuo; Hiromatsu, Masato; Asanabe, Sadao; and Saki, Kunio, 4,481,867, Cl. 91-487.000.
Kawata, Shun: *See*—
Yamazaki, Yoshio; Kawamoto, Kiyoaki; and Kawata, Shun, 4,482,244, Cl. 355-15.000.
Kazmaier, Gunther: *See*—
Goller, Ernst; Kazmaier, Gunther; and Trissler, Hans D., 4,481,795, Cl. 66-150.000.
Keating, Richard T. Deep fat fryer with extended heat transfer tubes. 4,481,873, Cl. 99-403.000.
Keiichi, Achiba: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.
Keith, Alec D., to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing propranolol. 4,482,533, Cl. 421-28.000.
Keller and Knappich Wehrtechnik GmbH, Firma: *See*—
Schiele, August; and Huber, Wolfgang, 4,481,860, Cl. 89-34.000.
Keller, Teddy M., to United States of America, Navy. Fl Polyesters. 4,482,702, Cl. 528-299.000.

Kelley, Charles K.; and Jones, William W., to C. K. Kelley & Sons, Inc. Power unit for single line pneumatic tube system. 4,482,294, Cl. 415-219.00R.

Kemp, Thomas L., to UOP Inc. Process for the separation of particulate solids from vapors using a discharge having a helical twist. 4,482,451, Cl. 208-161.000.

Kendall Company, The: *See*—
Arkans, Edward J., 4,481,937, Cl. 128-24.00R.
Hayes, John B., 4,481,679, Cl. 2-2.000.

Kendig, Willard Z., to Kenna Research International. Sonic carburetor. 4,482,507, Cl. 261-39.00D.

Kenna Research International: *See*—
Kendig, Willard Z., 4,482,507, Cl. 261-39.00D.

Kennecott Corporation: *See*—
Ruhl, Robert C., 4,481,800, Cl. 72-10.000.

Kennedy, Raymond: *See*—
Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, 4,481,951, Cl. 128-516.000.

Keough, William R., to Atmosphere Furnace Company. Insulated atmosphere furnace. 4,482,316, Cl. 432-198.000.

Keritsis, Gus D.: *See*—
Rainer, Norman B.; and Keritsis, Gus D., 4,481,958, Cl. 131-331.000.

Kern, Charles L., Jr.: *See*—
Smith, Richard R.; and Kern, Charles L., Jr., 4,482,586, Cl. 428-35.000.

Kern & Co. AG: *See*—
Canzek, Ludvik, 4,482,219, Cl. 350-444.000.
Hoffmann, Dieter, 4,482,118, Cl. 248-180.000.

Kesselring, Lutz; and Frodrich, Horst, to MAPA GmbH Gummi-und Plastikwerke. Pacifier. 4,481,949, Cl. 128-360.000.

Kessler, Erich; and Leeb, Alfons, to Akzo N.V. Fluid mixing apparatus and method. 4,482,254, Cl. 366-177.000.

Ketcham & McDougall, Inc.: *See*—
O'Brien, William F., 4,481,810, Cl. 73-178.00R.

Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D., 4,482,533, Cl. 421-28.000.

Keyes, Gary S.; Riederer, Stephen J.; Lambert, Thomas W.; and Stone, Barry N., to General Electric Company. Method and apparatus for X-ray image subtraction. 4,482,918, Cl. 358-111.000.

Khudenko, Boris M., to Georgia Tech Research Institute. Self-propelled jet aerator. 4,482,510, Cl. 261-91.000.

Kickawa, Katsumasa: *See*—
Kaneko, Kazuo; Obara, Toshio; Gonda, Michihiro; Kickawa, Katsumasa; and Kanasugi, Mikiko, 4,482,905, Cl. 346-207.000.

Kida, Shuzi: *See*—
Nakagawa, Satoshi; Sugita, Hiroshi; Kida, Shuzi; Uemura, Morito; and Kishi, Ken-ichi, 4,482,629, Cl. 430-542.000.

Kidawara, Atsushi; and Kobayashi, Kazunari, to Olympus Optical Co., Ltd. Film cassette. 4,482,050, Cl. 206-389.000.

Kiefer, Hans, to BASF Aktiengesellschaft. Preparation of vitamins K_3 and K_4 and derivatives. 4,482,492, Cl. 260-396.00K.

Kiehl, William C.; and McEwen, James P., to Deta Corporation. Parking meter with limited visibility pointer. 4,482,258, Cl. 368-90.000.

Kieninger & Obergfell: *See*—
Fehrenbacher, Wolfgang, 4,482,260, Cl. 368-180.000.

Kieser, Manfred: *See*—
Franz, Klaus-Dieter; Ambrosius, Klaus; Esselborn, Reiner; and Kieser, Manfred, 4,482,389, Cl. 106-291.000.

Kikuchi, Hideo: *See*—
Hibi, Kunio; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,482,147, Cl. 271-229.000.

Killer, Viktor, to Daverio A.G. Transport and separating apparatus for folded printed matter. 4,482,139, Cl. 270-52.000.

Kilner, Jerome R.; and Warren, Steven M., to Boeing Company, The. Automatic control system for directional control of an aircraft during landing rollout. 4,482,961, Cl. 364-428.000.

Kimberly-Clark Corporation: *See*—
Guy, Fredrick A.; and Ball, Robert S., 4,481,722, Cl. 34-47.000.

Kimble, James B.: *See*—
Eastman, Alan D.; and Kimble, James B., 4,482,646, Cl. 502-324.000.

Kimura, Hidetoshi, to Murata Kikai Kabushiki Kaisha. Pneumatic yarn splicing method and apparatus. 4,481,761, Cl. 57-22.000.

Kimura, Makoto: *See*—
Magariyama, Kenichi; Kimura, Makoto; and Terunuma, Hiroshi, 4,482,230, Cl. 354-219.000.

Kimura, Sosaku: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,481,742, Cl. 51-165.800.

King, Hewson N. G.: *See*—
Washington, Derek; King, Hewson N. G.; and Stubberfield, Pamela M., 4,482,836, Cl. 313-104.000.

King, Thomas M.; Champlin, Cary R.; and Daniel, Sam M., to Motorola, Inc. Function generator. 4,482,975, Cl. 364-608.000.

Kinstler, Robert C.: *See*—
Kaplan, Joel H.; and Kinstler, Robert C., 4,482,720, Cl. 548-158.000.

Kioritz Corporation: *See*—
Fukuoka, Takashi; and Kamata, Yoshikiyo, 4,482,028, Cl. 181-240.000.

Kirchmayr, Rudolf: *See*—
Dubas, Henri; and Kirchmayr, Rudolf, 4,482,463, Cl. 252-47.500.

Kirchner, Ralf: *See*—
Vock, Friedrich; Lesameister, Peter; and Kirchner, Ralf, 4,482,658, Cl. 523-348.000.

Kiser, Herbert H.: *See*—
Hurlebaus, Richard P.; and Kiser, Herbert H., 4,482,798, Cl. 219-137.710.

Kishi, Ken-ichi: *See*—
Nakagawa, Satoshi; Sugita, Hiroshi; Kida, Shuzi; Uemura, Morito; and Kishi, Ken-ichi, 4,482,629, Cl. 430-542.000.

Kitamoto, Tatsuji: *See*—
Akashi, Goro; Kitamoto, Tatsuji; and Okita, Tsutomu, 4,482,578, Cl. 427-44.000.

Kitamura, Yoshiaki: *See*—
Takeshita, Shigeo; and Kitamura, Yoshiaki, 4,481,891, Cl. 110-238.000.

Kitamura, Youichirou: *See*—
Aizawa, Kuniomi; Ohyama, Yasuyoshi; Okuma, Yasuo; Okano, Yoshio; and Kitamura, Youichirou, 4,482,802, Cl. 235-379.000.

Kitazawa, Kohji; and Ozaki, Toshio, to Hitachi Shipbuilding & Engineering Co., Ltd. Process for removing ash from coal. 4,482,351, Cl. 44-1.00R.

Kleemann, Axel; Deller, Klaus; Drauz, Karlheinz; and Lehmann, Bernd, to Degussa Aktiengesellschaft. Process for the production of 1,2-diols. 4,482,760, Cl. 568-811.000.

Kleemann, Axel: *See*—
Schwarze, Werner; and Kleemann, Axel, 4,482,759, Cl. 568-809.000.

Klein, Siegfried. Transducer for the transformation of electrical modulations into vibratory modulations. 4,482,788, Cl. 179-113.000.

Kleinecke, John D.: *See*—
Farag, Samir F.; and Kleinecke, John D., 4,482,892, Cl. 340-654.000.

Kleiner, Horst: *See*—
Huber, Guntram; Fischer, Wolfgang; Haeberle, Fritz; Kleiner, Horst; Riechers, Daniel; Klie, Wolfgang; and Tomforde, Johann, 4,482,180, Cl. 293-120.000.

Klemarczyk, Philip T., to International Flavors & Fragrances Inc. Substituted methyl isopropyl oxocyclohexane derivatives, organoleptic uses thereof and process for preparing same. 4,482,747, Cl. 568-376.000.

Klie, Wolfgang: *See*—
Huber, Guntram; Fischer, Wolfgang; Haeberle, Fritz; Kleiner, Horst; Riechers, Daniel; Klie, Wolfgang; and Tomforde, Johann, 4,482,180, Cl. 293-120.000.

Kljuev, Vladimir V.; Kozlov, Valery P.; Degterev, Alexandr P.; Vainberg, Irina A.; Demidov, Vladimir V.; and Filimonov, Anatoly N., deceased (by Filimonova, Elena V., administrator), to Nauchno-Issledovatelsky Institut Introskopii. Device for measurement of vibrations. 4,481,825, Cl. 73-655.000.

Klowak, Bernard G., to James River-Norwalk, Inc. Paper webs having high bulk and absorbency and process and apparatus for producing the same. 4,482,429, Cl. 162-111.000.

Knape, Richard S., to General Motors Corporation. Electromagnetic unit fuel injector. 4,482,094, Cl. 239-88.000.

Knapp, Heinrich; Sauer, Rudolf; Hans, Waldemar; Linssen, Mathias; Peczkowski, Jurgen; and Krauss, Rudolf, to Robert Bosch GmbH. Method for producing an electromagnetically actuatable fuel injection valve. 4,481,699, Cl. 29-157.10R.

Knecht, Adolf: *See*—
Gebhardt, Uwe; Augart, Helmut; and Knecht, Adolf, 4,482,554, Cl. 424-246.000.
Schneider, Michael; and Knecht, Adolf, 4,482,542, Cl. 424-157.000.

Knoll International, Inc.: *See*—
Zelkowitz, Hyman L.; Crawford, Jeffrey D.; and Mercer, Lucia, 4,482,119, Cl. 248-188.000.

Knorpp, Eberhard: *See*—
Binz, Reiner; Knorpp, Eberhard; and von Sichart, Frithjof, 4,482,995, Cl. 370-59.000.

Knott, Peter: *See*—
Telfer, Stewart B.; Zervas, George; and Knott, Peter, 4,482,541, Cl. 424-128.000.

Knudsen, Ronald D.; and Reiter, Stephen E., to Phillips Petroleum Company. Ethylene oligomerization. 4,482,640, Cl. 502-155.000.

Knuefelmann, Manfred: *See*—
Stwiorok, Andreas; Stojek, Dieter; Blauhut, Reinhold; Brandner, Burkhard; and Knuefelmann, Manfred, 4,481,912, Cl. 123-90.150.

Kobayashi, Kazunari: *See*—
Kidawara, Atsushi; and Kobayashi, Kazunari, 4,482,050, Cl. 206-389.000.

Kobayashi, Kazutaka: *See*—
Yoshida, Shinichi; and Kobayashi, Kazutaka, 4,482,920, Cl. 358-228.000.

Kobayashi, Tatsuo, to Toyota Jidosha Kabushiki Kaisha. Engine knock detecting apparatus. 4,481,924, Cl. 123-425.000.

Kobayashi, Toshio: *See*—
Takano, Toshio; and Kobayashi, Toshio, 4,481,877, Cl. 180-233.000.

Kobayashi, Tsuneki: *See*—
Kurosawa, Makoto; Nakano, Hiroshige; Hosoya, Kensei; and Kobayashi, Tsuneki, 4,481,880, Cl. 101-93.040.

Koch, Diether: *See*—
Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., 4,482,653, Cl. 523-144.000.

Koch, Raimund; and Spata, Paul. Photogrammetrical rectification device and method of detecting the adjusting values for the same. 4,482,223, Cl. 353-5.000.

Kocher, Helmut: *See*—
Handte, Reinhard; Matterstock, Karl; Bieringer, Hermann; and Kocher, Helmut. 4,482,373, Cl. 71-88.000.

Kockums AB: *See*—
Hellqvist, Kjell A., 4,481,818, Cl. 73-587.000.

Kodera, Yasuji, to Kabushiki-Kaisha Kodera Seisakusho. Universal joint for fishing lines. 4,482,264, Cl. 403-58.000.

Koenig, Rainer; Sieglen, Rolf; Weisser, Wolfgang; and Heide, Helga, to Luossavaara-Kiirunavaara AB. Process and equipment for collecting magnetite-containing ore dust samples and determining the magnetite and phosphorous contents thereof. 4,482,864, Cl. 324-226.000.

Koetsier, Wicher T., to Exxon Research & Engineering Co. Hydrocarbon conversion process with a composite zeolite. 4,482,774, Cl. 585-481.000.

Koga, Tsuguaki: *See*—
Yoneyama, Takao; Satoh, Ichiya; Obara, Sanshiro; Inoue, Tomoaki; and Koga, Tsuguaki, 4,481,819, Cl. 73-593.000.

Kohara, Kenichi: *See*—
Iwataki, Isao; Nakayama, Akira; Kaeriyama, Minoru; Ishikawa, Hisao; Hosaka, Hideo; Kohara, Kenichi; and Yamada, Shozo, 4,482,740, Cl. 564-99.000.

Kohl, Paul A.; and Ostermayer, Frederick W., Jr., to AT&T Bell Laboratories. Photoelectrochemical etching of n-type gallium arsenide. 4,482,442, Cl. 204-129.300.

Kohl, Paul A.: *See*—
Bacon, Duane E.; Bessette, Jeffrey R.; and Kohl, Paul A., 4,482,443, Cl. 204-129.300.

Kohler, Fritz: *See*—
Cuche, Claude; and Kohler, Fritz, 4,481,793, Cl. 66-75.200.

Kohsiek, Cord H., to U.S. Philips Corporation. Integrated circuit having stray capacitance compensation. 4,482,820, Cl. 307-303.000.

Koike, Eishi, to Ozen Corporation. Simplified sound-reproducing device for a record disc having a plurality of recorded grooves. 4,482,990, Cl. 369-63.000.

Koizumi, Hideo; Koseki, Isamu; Morita, Tadashi; Yamazaki, Shu; and Fukuhara, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Rotary anode for an X-ray tube and a method for manufacturing the same. 4,482,837, Cl. 378-144.000.

Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. 3-Substituted-2-oxo-tetrahydro-pyrrol[1,2-a]pyrimidines having digitalis-like activity. 4,482,557, Cl. 424-251.000.

Kollmorgen Technologies Corporation: *See*—
Tardieu, Pierre R.; and Mulet-Marquis, Yves H., 4,482,829, Cl. 310-105.000.

Kolodner, Paul R.: *See*—
Katzir, Abraham; and Kolodner, Paul R., 4,482,424, Cl. 156-626.000.

Komatsubara, Shigemaru, to Victor Company of Japan, Ltd. Method of manufacturing a stamper for information storage discs. 4,482,511, Cl. 264-22.000.

Kommoss, Klaus; and Schmidt, Erhard, to U.S. Philips Corporation. Test cassette for measuring the torque of a winding mandrel of a cassette-playing apparatus. 4,481,832, Cl. 73-862.080.

Komori Printing Machinery Co., Ltd.: *See*—
Hoshi, Toshio, 4,481,878, Cl. 101-23.000.

Komoto, Akira, to Shimadzu Corporation. Electronic balance with load placement deviation correction. 4,482,022, Cl. 177-25.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Nakagawa, Satoshi; Sugita, Hiroshi; Kida, Shuzi; Uemura, Morito; and Kishi, Ken-ichi, 4,482,629, Cl. 430-542.000.
Yamazaki, Yoshio; Kawamoto, Kiyoaki; and Kawata, Shun, 4,482,244, Cl. 355-15.000.

Konter, Wolfgang: *See*—
Musch, Rudiger; Gobel, Wilhelm; Muller, Eberhard; and Konter, Wolfgang, 4,482,676, Cl. 525-215.000.

Kopera, Paul M.: *See*—
Stowe, David W.; and Kopera, Paul M., 4,482,203, Cl. 350-96.150.

Koppers Company, Inc.: *See*—
Harju, Philip H.; and Call, Kenneth R., 4,482,643, Cl. 502-242.000.

Koriyama, Masayuki: *See*—
Ogasawara, Takashi; Hasebe, Tetsuzi; and Koriyama, Masayuki, 4,481,982, Cl. 139-435.000.

Korowitz, Simon; and McMenamin, Francis E., to General Signal Corporation. Hybrid optical/electrical data highway. 4,482,980, Cl. 364-900.000.

Koseki, Isamu: *See*—
Koizumi, Hideo; Koseki, Isamu; Morita, Tadashi; Yamazaki, Shu; and Fukuhara, Yoshio, 4,482,837, Cl. 378-144.000.

Koster, Karl H.; and Gunther, Roland, to AUMOND-Fordererbau GmbH Maschinenfabrik. Wire rope connector with length adjustment capacity. 4,481,695, Cl. 24-32.000.

Kot, Norbert J., II. Magnetic drill holder. 4,482,049, Cl. 206-379.000.

Kotani, Takeshi: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,915, Cl. 123-188.00M.
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,916, Cl. 123-188.00M.

Koth, Detlev: *See*—
Ettlinger, Manfred; Ferch, Horst; Koth, Detlev; and Simon, Edgar, 4,482,642, Cl. 502-232.000.

Kouno, Shinichi: *See*—
Kawada, Shigeki; Ishida, Hiroshi; and Kouno, Shinichi, 4,482,854, Cl. 318-801.000.

Kovalenko, Sergei S.: *See*—
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; and Chicherin, Jury E., 4,482,950, Cl. 364-200.000.

Kovaleski, Joseph J., to Wyrepak Industries, Inc. Low-friction thin-hub plastic multi-part sheave. 4,482,340, Cl. 474-180.000.

Kovalick, Albert W., to Hewlett-Packard Company. Apparatus and method of phase-to-amplitude conversion in a sine function generator. 4,482,974, Cl. 364-607.000.

Kovalovsky, Oscar. Geared fishing reel. 4,482,106, Cl. 242-220.000.

Kovar, Robert F.: *See*—
Bouley, Robert W.; and Kovar, Robert F., 4,482,590, Cl. 428-35.000.

Kowa Company, Ltd.: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

Kowalski, Robert J. Archery bow sight. 4,481,717, Cl. 33-265.000.

Koyo Machine Industries Company, Inc.: *See*—
Anegawa, Kazuhiro, 4,482,162, Cl. 279-1.00J.

Koza, Manfred, to General Motors Corporation. Fastener for interconnecting vehicle door lock components. 4,482,265, Cl. 403-71.000.

Kozlov, Valery P.: *See*—
Kljuev, Vladimir V.; Kozlov, Valery P.; Degterev, Alexandr P.; Vainberg, Irina A.; Demidov, Vladimir V.; and Filimonov, Anatoly N., deceased, 4,481,825, Cl. 73-655.000.

Kramer, James H., to B. F. Goodrich Company, The. Vibration isolation pad. 4,482,592, Cl. 428-67.000.

Kraus, Gerard, to Phillips Petroleum Company. Rubber compositions comprising a siliceous filler in combination with an organosulfur substituted pyridine promotor. 4,482,663, Cl. 524-99.000.

Kraus, Richard B., to General Kinematics Corporation. Flexible trough vibratory conveyor. 4,482,046, Cl. 198-771.000.

Krauss, Rudolf: *See*—
Knapp, Heinrich; Sauer, Rudolf; Hans, Waldemar; Linssen, Mathias; Peczkowski, Jurgen; and Krauss, Rudolf, 4,481,699, Cl. 29-157.10R.

Krejci, Ivan: *See*—
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.

Kreuder, Hans J.: *See*—
Wegner, Christian; Muller, Hanns-Peter; and Kreuder, Hans J., 4,482,721, Cl. 548-262.000.

Krogsrud, Harald, to Elkem a/s. Apparatus for cooling a body. 4,482,317, Cl. 432-238.000.

Krohe, Wilfried: *See*—
Giese, Hans-Joachim; Heiker, Walter R.; and Krohe, Wilfried, 4,482,314, Cl. 432-11.000.

Kruck, Dieter: *See*—
Hauschild, Wolfgang; and Kruck, Dieter, 4,482,884, Cl. 340-52.00D.

Kruger, James B.: *See*—
Darley, Henry M.; Houston, Theodore W.; and Kruger, James B., 4,481,704, Cl. 29-571.000.

Krumkalns, Eriks V., to Eli Lilly and Company. Substituted 1-thia-3-aza-4-ones. 4,482,712, Cl. 544-54.000.

Krupp-Koppers GmbH: *See*—
Petrovic, Vladan; and Durselen, Heinz, 4,481,724, Cl. 34-168.000.

Kruse, Gary S.: *See*—
Burgeson, John E.; and Kruse, Gary S., 4,482,878, Cl. 335-216.000.

Kruse, Walter M.; and Stephen, John F., to ICI Americas Inc. High yield process for preparing 4,4'-biphenol and para-alkylbenzenes. 4,482,755, Cl. 568-730.000.

Kubasiak, Duane T.: *See*—
Findley, Samuel A.; and Kubasiak, Duane T., 4,481,838, Cl. 74-493.000.

Kubbota, Massashi: *See*—
Katsura, Toru; and Kubbota, Massashi, 4,482,628, Cl. 430-538.000.

Kubota, Jun; Ishii, Junichi; and Sasaki, Soji, to Hitachi, Ltd. Synthetic aperture ultrasonic testing apparatus with shear and longitudinal wave modes. 4,481,822, Cl. 73-625.000.

Kuboyama, Morio: *See*—
Funakoshi, Satoshi; Morimoto, Kazuo; Kuboyama, Morio; Yanai, Nobuya; Yamada, Muneo; and Yokota, Hajime, 4,482,485, Cl. 260-112.00R.

Kuchenbecker, Morris W., to James River-Dixie/Northern, Inc. Disposable cup dispenser. 4,482,079, Cl. 221-310.000.

Kudelski, Stefan; and Schlup, Jean-Claude, to Robert Bosch GmbH. Method and system for thermally recording information on a metalized recording carrier. 4,482,901, Cl. 346-1.100.

Kudo, Takashi: *See*—
Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, 4,482,636, Cl. 436-518.000.

Kudomi, Hiroyuki; and Sato, Shinichi, to Mitsubishi Chemical Industries, Limited. Process for preparing water-soluble, partially-hydrolyzed, solid acrylamide polymer. 4,482,682, Cl. 525-369.000.

Kuehl, Guenter H., to Mobil Oil Corporation. Synthesis of ZSM-12 zeolite. 4,482,531, Cl. 423-329.000.

Kuge, Tsukasa; Tanigawa, Koichi; and Adachi, Hiroyuki, to Canon Kabushiki Kaisha. Electrophotographic process utilizing electrostatic separation and apparatus therefor. 4,482,240, Cl. 355-3.0TR.

Kuhle, Engelbert; and Hagemann, Hermann, to Bayer Aktiengesellschaft. Preparation of N-substituted N-isocyanatocarbonyl-carbamates. 4,482,737, Cl. 560-115.000.

Kuhnrich, Robert; Schade, Gerhard; and Elmenthaler, Bernd, to Dynamit Nobel AG. Method for the preparation of light-colored polyesters with the use of titanium catalysts. 4,482,700, Cl. 528-279.000.

Kumakura, Toshio: *See—*
Tabaru, Kazunori; Aoyama, Takafumi; and Kumakura, Toshio, 4,482,623, Cl. 430-137.000.

Kunieda, Hisashi: *See—*
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

Kuniya, Keiichi: *See—*
Chiba, Akio; Shimizu, Seiki; Kuniya, Keiichi; and Onuki, Jin, 4,482,912, Cl. 357-67.000.

Kupkova, Bela: *See—*
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Shigeta, Masatomo; Isii, Yosio; and Hoshi, Akio, 4,482,452, Cl. 208-177.000.

Kurek, Paul R., to UOP Inc. Preparation of xylylenediamine. 4,482,741, Cl. 564-415.000.

Kuroda, Kouki: *See—*
Suzuki, Koji; Kuroda, Kouki; and Nagahira, Jyoji, 4,482,243, Cl. 355-14.00D.

Kuroki, Hironori; and Honda, Tsuguo, to Kuroki Kogyosho Co., Ltd. Low alloy or carbon steel roll with a built-up weld layer of an iron alloy containing carbon, chromium, molybdenum and cobalt. 4,482,612, Cl. 428-683.000.

Kuroki Kogyosho Co., Ltd.: *See—*
Kuroki, Hironori; and Honda, Tsuguo, 4,482,612, Cl. 428-683.000.

Kurosawa, Makoto; Nakano, Hiroshige; Hosoya, Kensei; and Kobayashi, Tsuneki, to Hitachi Koki Company Limited. Dot printer. 4,481,880, Cl. 101-93.040.

Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., to Fairchild Camera & Instrument Corporation. Pulse-width control of bonding ball formation. 4,482,794, Cl. 219-56.220.

Kurtz, Robert J.; and LiCausi, Joseph, to BioResearch Inc. Orthopedic foot splint with swivel. 4,481,940, Cl. 128-80.00A.

Kurushima, Tadanori; Yoshida, Yoshiaki; and Kamiya, Kazuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Sliver guide for use in open-end spinning frames. 4,481,765, Cl. 57-412.000.

Kurushima, Tadanori; Takeshita, Kiyoshi; and Kamiya, Kazuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Yarn draw off tube for open-end spinning unit. 4,481,766, Cl. 57-417.000.

Kurz, Gerhard. Operating-condition indicator for vacuum cleaners. 4,481,692, Cl. 15-339.000.

Kuwashima, Hidesumi: *See—*
Araki, Tutomu; and Kuwashima, Hidesumi, 4,481,776, Cl. 60-660.000.

Kyllingstad, Vernon L.: *See—*
Berta, Dominic A.; and Kyllingstad, Vernon L., 4,482,681, Cl. 525-349.000.

Kyotani, Yoshinori: *See—*
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

L. Schuler GmbH: *See—*
Schneider, Franz; Bergmann, Ewald; and Gering, Gerhard, 4,481,847, Cl. 83-530.000.

LaBate, Micheal D. Method and apparatus for monitoring erosion in gas stirring devices in molten metal ladles. 4,481,809, Cl. 73-86.000.

Lackman, George E.: *See—*
Hannon, R. Douglas; and Lackman, George E., 4,482,298, Cl. 416-234.000.

Lacoste, Francois R. Air fluidized bed for therapeutic use. 4,481,686, Cl. 5-453.000.

Lacotte, Jean-Pierre; Fichot, Bernard; and Troude, Gilles, to Thomson-CSF. Optical sensor for focusing control. 4,482,803, Cl. 250-201.000.

Ladd, David L.; and Weinstock, Joseph, to SmithKline Beckman Corporation. 1-Acylamino-1-cyclopentanecarboxylic acids. 4,482,572, Cl. 424-319.000.

Ladin, Eli M., to Federal-Mogul Corporation. Self-aligning clutch release bearing assembly with lubrication reservoir. 4,482,041, Cl. 192-98.000.

La Fata, John E.; and Cuccio, John D., to Product Originators, Inc. Amusement device for making bubbles. 4,481,731, Cl. 446-15.000.

Lagakos, Nicholas; and Bucaro, Joseph A., to United States of America, Navy. Temperature-insensitive optical fibers. 4,482,205, Cl. 350-96.340.

Laimins, Eric, to Hottinger Baldwin Measurements, Inc. Patient weighing scale with hoist. 4,482,783, Cl. 177-147.000.

Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., to Hoechst Aktiengesellschaft. Pyrimido (6,1-a)isoquinolin-4-one derivatives. 4,482,556, Cl. 424-251.000.

Lalley, Donald P. Multipurpose container. 4,482,074, Cl. 220-4.00F.

Lamansky, Daniel R. Nail removing hammer. 4,482,132, Cl. 254-26.00R.

Lambert, James N.: *See—*
Pollock, Charles B.; Murzyn, Patrick J.; Brennom, Stephen O.; and Lambert, James N., 4,482,392, Cl. 134-7.000.

Lambert, Ralph E.: *See—*
Harman, Douglas G.; and Lambert, Ralph E., 4,481,802, Cl. 72-53.000.

Lambert, Thomas W.: *See—*
Keyes, Gary S.; Riederer, Stephen J.; Lambert, Thomas W.; and Stone, Barry N., 4,482,918, Cl. 358-111.000.

Lamberti, Vincent, to Lever Brothers Company. Powdered nonionic-based detergent compositions containing magnesium sulfate. 4,482,468, Cl. 252-133.000.

Lamparsky, Dietmar: *See—*
Kaiser, Roman; and Lamparsky, Dietmar, 4,482,762, Cl. 368-840.000.

Lampson, Alan I.: *See—*
Ortwerth, Paul J.; and Lampson, Alan I., 4,483,006, Cl. 372-58.000.

Landgraf, Hermann: *See—*
Hain, Josef; and Landgraf, Hermann, 4,482,322, Cl. 433-88.000.

Langer, Heimo J.: *See—*
Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., 4,482,653, Cl. 523-144.000.

Lanz, Paul: *See—*
Furlenmeier, Andre ; and Lanz, Paul, 4,482,551, Cl. 424-246.000.

Larsen, Claus: *See—*
Thorbek, Pia; Bundgaard, Hans; and Larsen, Claus, 4,482,722, Cl. 548-338.000.

Larsen, Robert H.: *See—*
Odermann, Charles R.; and Larsen, Robert H., 4,481,897, Cl. 112-279.000.

Larsen, Stephen H.: *See—*
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., 4,482,488, Cl. 260-112.50R.

Larson, John D., III: *See—*
Dias, J. Fleming; Karrer, H. Edward; Larson, John D., III; Wilson, David A.; and Hanafy, Amin M., 4,482,834, Cl. 310-327.000.

Lassiter, John, Jr. Flight control mixing system. 4,482,115, Cl. 244-220.000.

Laurent, Sebastian M.: *See—*
Sanders, Robert N.; and Laurent, Sebastian M., 4,482,530, Cl. 423-329.000.

Lavagnino, Edward R.: *See—*
Cooper, Robin D. G.; Graves, Bernard J.; and Lavagnino, Edward R., 4,482,553, Cl. 424-246.000.

Lawrence, Drummond M. P.: *See—*
Cowie, William P.; Lawrence, Drummond M. P.; and Goodlad, Morgan H., 4,481,693, Cl. 17-46.000.

Lawsing, Joseph W., to United Technologies Corporation. Temperature sensor. 4,482,091, Cl. 236-92.00R.

Le Bayon, Rene; Faucon, Roger; and Legrix, Jacqueline, to USM Corporation. Battery separators. 4,482,617, Cl. 429-143.000.

LeCroy Research Systems Corporation: *See—*
Ems, Stephen C.; and Yamrone, Brian M., 4,482,826, Cl. 307-602.000.

Lee, Chang R., to Stauffer Chemical Company. Process for the preparation of protein for hydrolysis. 4,482,574, Cl. 426-7.000.

Lee, David L., to Stauffer Chemical Company. Certain 1,3-cyclohexanedione adducts of substituted phenoxyphenoxypropionic acids and their use as an herbicide. 4,482,727, Cl. 549-291.000.

Leeb, Alfons: *See—*
Kessler, Erich; and Leeb, Alfons, 4,482,254, Cl. 366-177.000.

Leehey, Jonathan R., to Charles Stark Draper Laboratory, Inc., The. Current sensor. 4,482,862, Cl. 324-117.00R.

Legrix, Jacqueline: *See—*
Le Bayon, Rene; Faucon, Roger; and Legrix, Jacqueline, 4,482,617, Cl. 429-143.000.

Legros, Jean: *See—*
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,482,495, Cl. 260-402.500.

Lehmann, Bernd: *See—*
Kleemann, Axel; Deller, Klaus; Drauz, Karlheinz; and Lehmann, Bernd, 4,482,760, Cl. 568-811.000.

Lehner, August: *See—*
Blum, Rainer; Lehner, August; and Rubbert, Bernhard, 4,482,664, Cl. 524-212.000.

Lehr, Klaus; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for removing nitrogen dioxide from off-gas. 4,482,527, Cl. 423-235.000.

Leiber, Heinz, to Robert Bosch GmbH. Anti-skid braking apparatus. 4,482,192, Cl. 303-100.000.

Leland, John E.; and Boeke, Paul J., to Phillips Petroleum Company. Poly(arylene sulfide) containing talc. 4,482,668, Cl. 524-413.000.

Lenahan, James B.; and Baier, Arnold A., to General Electric Company. Closed loop balancing. 4,482,963, Cl. 364-463.000.

Lerouge, Bernard: *See—*
Grand-Perret, Philippe; and Lerouge, Bernard, 4,482,813, Cl. 290-40.00R.

LeRoy, Rodney L.: *See—*
Bowen, Christopher T.; Davis, H. John; and LeRoy, Rodney L., 4,482,448, Cl. 204-284.000.

Lessmeister, Peter: *See—*
Streitberger, Hans-Joachim; Lessmeister, Peter; and Zdahl, Norbert, 4,482,446, Cl. 204-181.00C.
Vock, Friedrich; Lessmeister, Peter; and Kirchner, Ralf, 4,482,658, Cl. 523-348.000.

Lester, James M.: *See—*
Reinker, Richard P.; Poyer, Myron E.; and Lester, James M., 4,481,778, Cl. 62-45.000.

Le Touche, Roger, to Societe Nationale Industrielle Aerospatiale. Thermal protection or dissipation screen. 4,482,111, Cl. 244-117.00A.

Le Vantine, Allan D. Film cleaner attachment device for use with disc-film. 4,481,691, Cl. 15-306.00R.

Lever Brothers Company: *See*—
Boot, Jacobus; Rozendaal, Adrianus; and Schijf, Robert, 4,482,576, Cl. 426-603.000.
Lamberti, Vincent, 4,482,468, Cl. 252-133.000.

Leverett, William H., to Durand-Wayland, Inc. Apparatus and process for sorting articles. 4,482,061, Cl. 209-592.000.

Levine, Harold H., to Lockheed Corporation. Deployment system for emergency oxygen mask. 4,481,945, Cl. 128-206.270.

Levine, Norman D. Heavy bag and stand. 4,482,150, Cl. 272-78.000.

Levitator, Inc.: *See*—
Stevenson, Ernest W.; and Nahas, Randall E., 4,482,268, Cl. 405-3.000.

Lewellyn, Morris E., to American Cyanamid Company. Process for the preparation of N-allyl-O-alkyl thionocarbamates. 4,482,500, Cl. 260-455.00A.

Lewis, Clarence A.; Lewis, James E.; and Lewis, Richard D. Distance sensing apparatus and method. 4,482,972, Cl. 364-561.000.

Lewis, Frederick M., to Sterling Drug Inc. Method for controlling temperatures in the afterburner and combustion hearths of a multiple hearth furnace. 4,481,890, Cl. 110-225.000.

Lewis, James D.: *See*—
Bowman, Jeffery B.; Hubis, Daniel E.; Lewis, James D.; Newman, Stephen C.; and Staley, Richard A., 4,482,516, Cl. 264-127.000.

Lewis, James E.: *See*—
Lewis, Clarence A.; Lewis, James E.; and Lewis, Richard D., 4,482,972, Cl. 364-561.000.

Lewis, John C., to Park-Ohio Industries, Inc. Apparatus for simultaneously heating a plurality of elongated workpieces. 4,482,793, Cl. 219-10.710.

Lewis, Richard D.: *See*—
Lewis, Clarence A.; Lewis, James E.; and Lewis, Richard D., 4,482,972, Cl. 364-561.000.

Leybold-Heraeus GmbH: *See*—
Weissmann, Klaus, 4,482,796, Cl. 219-121.0EC.

Liao, Hsiang P.: *See*—
Finley, Joseph H.; and Liao, Hsiang P., 4,482,506, Cl. 260-982.000.

LiCausi, Joseph: *See*—
Kurtz, Robert J.; and LiCausi, Joseph, 4,481,940, Cl. 128-80.00A.

Liepmann, Hans: *See*—
Roemer, Dietmar; Ruhland, Michael; Zeugner, Horst; Milkowski, Wolfgang; and Liepmann, Hans, 4,482,548, Cl. 424-244.000.

Lilly Industries Limited: *See*—
Simmonds, Robin G., 4,482,484, Cl. 260-112.00B.

Lin, Ping-Wad. Apparatus for producing cementitious product from quenched fly ash. 4,482,096, Cl. 241-65.000.

Lincourt, William R. Support platform. 4,482,030, Cl. 182-121.000.

Lindahl, Lars; and Carlsson, Bengt, to Reheat AB. Method of lining a fluid connection opening in a frame plate of a plate heat exchanger. 4,482,089, Cl. 228-173.00C.

Lindley, John E. Resuscitator, respirator and/or incubator. 4,481,938, Cl. 128-30.000.

Lindner, Henry, to Elgin Molded Plastics. Barrier light assembly. 4,482,941, Cl. 362-186.000.

Link, Achim, to Fichtel & Sachs AG. Lubricating control system for clutches. 4,482,037, Cl. 192-3.580.

Link, Helmut: *See*—
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,482,739, Cl. 564-54.000.

Linker, Frank V., to American Tech Manufacturing Inc. Electronic component lead straightening device and method. 4,481,984, Cl. 140-147.000.

Linssen, Mathias: *See*—
Knapp, Heinrich; Sauer, Rudolf; Hans, Waldemar; Linssen, Mathias; Peczkowski, Jurgen; and Krauss, Rudolf, 4,481,699, Cl. 29-157.10R.

Lippoldt, Roland: *See*—
Baudisch, Hans-Dieter; and Lippoldt, Roland, 4,482,522, Cl. 422-104.000.

List, Joseph O.: *See*—
Rider, Frederick H., Jr.; and List, Joseph O., 4,482,176, Cl. 292-87.000.

Litton Industrial Products, Inc.: *See*—
Depweg, Frank A., 4,482,163, Cl. 279-1.00H.

Littrell, Marshall W.: *See*—
Karau, Philip A.; Littrell, Marshall W.; and Brooks, John S., 4,481,925, Cl. 123-425.000.

Liu, Tony Y., to Valspar Corporation, The. Aluminized epoxy-urethane coating. 4,482,661, Cl. 523-439.000.

LMT-Radio Professionnelle: *See*—
Marchand, Maurice; and Jens, Yan H., 4,482,867, Cl. 330-277.000.

Lock, William E., to Corning Glass Works. Non-slip design transfer to conical articles. 4,481,879, Cl. 101-39.000.

Lockheed Corporation: *See*—
Levine, Harold H., 4,481,945, Cl. 128-206.270.

Lockheed Missiles & Space Co., Inc.: *See*—
Pohle, Richard H., 4,482,208, Cl. 350-286.000.

Logoni, Angelo: *See*—
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; and Logoni, Angelo, 4,482,570, Cl. 424-304.000.

Logsdon, Gary L.: *See*—
Wilson, Jesse R.; and Logsdon, Gary L., 4,482,996, Cl. 370-60.000.

Lohbauer, Kenneth R.; and Moots, Paul C., to Caterpillar Tractor Co. Fluid system with flow compensated torque control. 4,481,770, Cl. 60-452.000.

Lokring: *See*—
Puri, Vijay K., 4,482,174, Cl. 285-382.200.

Long, William D.: *See*—
Swaney, Richard E.; and Long, William D., 4,482,951, Cl. 364-200.000.

Long, William E., to Ciba-Geigy AG. Dyestuffs and their use in photographic material. 4,482,716, Cl. 546-211.000.

Lonza Ltd.: *See*—
Dinkel, Rolf; Roedel, Hilmar; and Grayson, James I., 4,482,717, Cl. 546-251.000.

Loosemore, William R.; Watkins, Roger D.; and Desborough, Colin L., to British Nuclear Fuels Limited. Measurement of fluid oscillation amplitude. 4,481,811, Cl. 73-198.000.

L'Oreal: *See*—
Bauer, Daniel P.; Beck, Jean-Paul H.; and Grognet, Jean-Claude J., 4,481,961, Cl. 132-7.000.
Goncalves, Antonin L., 4,482,082, Cl. 222-182.000.

Lorenz, Dieter, to Deutsche Forschungs, und Verschsanstalt fur Luft- und Raumfahrt e.V. Calibration method and apparatus for optical scanners. 4,482,252, Cl. 356-448.000.

Lorin, Andre ; Rosilio, Andre ; and Tanguy, Jean, to Commissariat a l'Energie Atomique. Process for the production of a capacitive hygrometer. 4,482,581, Cl. 427-79.000.

Lucas Industries Limited: *See*—
Ironside, John M.; Deller, Nigel A.; Sainsbury, Clive R.; and Weston, Paul, 4,481,844, Cl. 74-866.000.

Luder, Ernst; Kallfass, Traugott; and Borgwardt, Christian, to Endress u. Hauser GmbH u. Co. Moisture sensor with valve metal composition electrodes. 4,482,882, Cl. 338-34.000.

Ludewig, Hartmut: *See*—
Brobeck, Helmut; Ludewig, Hartmut; Miribel, Wolfgang; and Stonner, Helmut, 4,482,304, Cl. 417-407.000.

Ludowyk, Christopher J.; and Gee, Stewart G. W., to Commonwealth of Australia. Workpiece loading apparatus. 4,481,817, Cl. 73-583.000.

Ludwig, Dahm: *See*—
Helmut, Beschke; Ludwig, Dahm; and Heinz, Friedrich, 4,482,719, Cl. 546-286.000.

Luebbe, Ray H., Jr.; and Carter, Mark A., to Exxon Research & Engineering Co. Support layer for electric discharge transfer materials. 4,482,599, Cl. 428-212.000.

Lueptow, Richard M.; and Peterson, Jeffrey J., to Haemonetics Corporation. Blood processing system for cell washing. 4,482,342, Cl. 494-21.000.

Luetzelschwab, Wayne E., to Marathon Oil Company. Method and apparatus for multiple recycle polymer dilution. 4,482,704, Cl. 528-480.000.

Luke, John A.; and MacLean, Kenneth J. H., to British-American Tobacco Company Limited. Cigarettes. 4,481,954, Cl. 131-77.000.

Lumalampan Aktiebolag: *See*—
Sikander, Ake; Bjorkman, Ake; and Jonsson, Gunther, 4,481,889, Cl. 110-212.000.

Luossavaara-Kiirunavaara AB: *See*—
Koenig, Rainer; Sieglen, Rolf; Weisser, Wolfgang; and Heide, Helga, 4,482,864, Cl. 324-226.000.

Lynch, Neil P., to Whirlpool Corporation. Sequentially controlled single evaporator refrigerator. 4,481,787, Cl. 62-180.000.

Lyons, James E.: *See*—
Hsu, Chao-Yang; and Lyons, James E., 4,482,756, Cl. 568-772.000.

M.B.F. Plastiques: *See*—
Gagliardi, Jean Claude, 4,482,073, Cl. 215-332.000.

M.G.I. Co., Ltd.: *See*—
Toyosato, Kaku, 4,481,875, Cl. 99-584.000.

M. W. Kellogg Company, The: *See*—
Peterson, Robert B., 4,482,523, Cl. 422-148.000.

Maarschalkerweerd, Jan M., to Trojan Technologies Inc. Ultraviolet fluid purifying device. 4,482,809, Cl. 250-436.000.

Mabuchi, Kenichi, to Bio Mabuchi Co., Ltd. Beauty treatment device. 4,481,939, Cl. 128-57.000.

MacDonald, Robert C.: *See*—
Enriquez, Emanuel E.; and MacDonald, Robert C., 4,482,032, Cl. 187-29.00R.

Macey, Keith S., to K. S. Macey Machine Company, Inc. Start-up circuitry for stitching assemblies and the like. 4,482,140, Cl. 270-53.000.

Machova, Alena: *See*—
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.

MacLean, Kenneth J. H.: *See*—
Luke, John A.; and MacLean, Kenneth J. H., 4,481,954, Cl. 131-77.000.

Maeno, Fumio: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,481,742, Cl. 51-165.800.

Maeno, Tsuyoshi: *See*—
Tsuda, Tadashi; Hiramatsu, Seiichiro; Maeno, Tsuyoshi; and Ohtsuka, Mitsugi, 4,482,889, Cl. 340-514.000.

Maerz Ofenbau AG: *See*—
Fussl, Erwin; and Waldert, Horst, 4,482,280, Cl. 414-21.000.

Magaha, Harold S.: *See*—
Karol, Thomas J.; Schlicht, Raymond C.; and Magaha, Harold S., 4,482,464, Cl. 252-51.50A.

Magariyama, Kenichi; Kimura, Makoto; and Terunuma, Hiroshi, to Nippon Kogaku K.K. View finder unit mounted on a single lens reflex camera. 4,482,230, Cl. 354-219.000.

Magnesium Castings Limited: *See*—
Smedley, Dennis; and Spare, Noel C., 4,482,001, Cl. 164-113.000.

Mah, Clifford S. Atmospheric fluidized bed combustor. 4,481,892, Cl. 110-263.000.

Maier, Franz: *See*—
Schindler, Erich; and Maier, Franz, 4,482,514, Cl. 264-41.000.

Maine Yankee Atomic Power Company: *See*—
Randazza, John B., 4,482,520, Cl. 376-261.000.

Majaniemi, Pekka, to OY. Tampella AB. Extended nip press lubricating system for a paper machine. 4,482,430, Cl. 162-358.000.

Major nee Feistner, Piroska: *See*—
Boor, Anna; Toth, Jozsef; Szen, Tamas; Gabor, Laszlo; Major nee Feistner, Piroska; and Holly, Sandor, 4,482,494, Cl. 260-397.400.

Makabe, Hideki; Yamamoto, Toyoji; Matsueda, Yoshio; Ito, Yasunori; and Yamada, Katsuto, to Kalnew Optical Industrial Co., Ltd. Apparatus for measuring the color of a brilliant-cut diamond. 4,482,245, Cl. 356-30.000.

Makino, Itsuo: *See*—
Hirai, Kentaro; Ishiba, Teruyuki; Matsutani, Shigeru; Makino, Itsuo; Fujishita, Toshio; Doeteuchi, Masami; and Otani, Koichi, 4,482,566, Cl. 424-274.000.

Makuta, Shunichi; Miyasaka, Hiroshi; and Takebe, Katsuhiko, to Rhythm Watch Company Limited. Sound generating circuit for timepiece. 4,481,852, Cl. 84-1.030.

Maldavs, Ojars, to Imperial Clevite Inc. Dust cap for fluid coupling. 4,481,977, Cl. 138-89.400.

Manke, Horst: *See*—
Schleese, Eckhardt; Gessner, Rudolf; and Manke, Horst, 4,482,412, Cl. 156-51.000.

Mannesmann AG: *See*—
Hess, Walter; Nicolai, Franz; and Gotting, Otto, 4,482,584, Cl. 427-286.000.

Mano, Toru; Fukuda, Takeshi; Fukushima, Toshitaka; Ueno, Kouji; and Tanaka, Kazuo, to Fujitsu Limited. Contact structure of semiconductor device. 4,482,914, Cl. 357-68.000.

Manville Service Corporation: *See*—
Cimochowski, Anthony E., 4,481,746, Cl. 52-404.000.

MAPA GmbH Gummi-und Plastikwerke: *See*—
Kesselring, Lutz; and Frodrich, Horst, 4,481,949, Cl. 128-360.000.

Marathon Oil Company: *See*—
Falk, David O., 4,482,015, Cl. 166-288.000.
Luetzelschwab, Wayne E., 4,482,704, Cl. 528-480.000.

Marchand, Maurice; and Jens, Yan H., to LMT-Radio Professionnelle. Microwave power transmitter for doppler radar. 4,482,867, Cl. 330-277.000.

Marchetti, Joseph R.: *See*—
Sanjana, Zal N.; and Marchetti, Joseph R., 4,482,659, Cl. 523-414.000.

Marcinko, Richard M.: *See*—
Woo, James T. K.; Ting, Vincent W.; and Marcinko, Richard M., 4,482,671, Cl. 525-31.000.

Marconi Company Limited, The: *See*—
Heal, John C. W.; and Dixon, George G., 4,482,848, Cl. 318-98.000.
Richardson, Robert; and Barker, Anthony T., 4,482,816, Cl. 307-106.000.

Marconi Instruments Limited: *See*—
Middleton, John D., 4,482,872, Cl. 331-178.000.

Margetts, George; Andrews, Roderic S.; and Legros, Jean, to Sterling Drug Inc. Mixed anhydrides of N'-acetylaminothioalkanoates. 4,482,495, Cl. 260-402.500.

Margison, Elwood R., to United Conveyor Corporation. Fluent solid material flow transducer. 4,481,831, Cl. 73-861.730.

Marotta Scientific Controls, Inc.: *See*—
deVersterre, William I.; and Worden, Donald A., 4,481,801, Cl. 72-21.000.

Marouf, Mohamed A.; and Vancil, Paul W., to AT&T Bell Laboratories. Method and apparatus for improving the quality of communication in a digital conference arrangement. 4,482,998, Cl. 370-62.000.

Marouf, Mohamed A.: *See*—
Bobsin, John H.; and Marouf, Mohamed A., 4,482,997, Cl. 370-62.000.

Marsh, Frank D.: *See*—
Heytler, Peter G.; and Marsh, Frank D., 4,482,371, Cl. 71-27.000.

Martenson, Richard B.: *See*—
Blaisdell, Ronald G.; Hough, Harold L.; and Martenson, Richard B., 4,482,942, Cl. 362-293.000.

Martin, Lawrence L.; and Setescak, Linda L., to Hoechst-Roussel Pharmaceuticals Inc. Substituted-1,3,4-benzotriazepines. 4,482,547, Cl. 424-244.000.

Martin, Reginald, deceased; by White, Winifred, legal representative; by Edwards, Nora, legal representative; Brookes, John W.; and Reeve, Thomas S. Oil gas/separator. 4,482,364, Cl. 55-158.000.

Martins, Joseph G.: *See*—
Donermeyer, Donald D.; Martins, Joseph G.; and Fabel, David A., 4,482,604, Cl. 428-336.000.

Marui, Tokuo: *See*—
Nakamura, Tadamitsu; Iwamoto, Yogaku; Kadotani, Kanichi; and Marui, Tokuo, 4,482,467, Cl. 252-70.000.

Marvin, Richard P.: *See*—
Shawen, Harley J.; and Marvin, Richard P., 4,482,057, Cl. 209-534.000.

Masaki, Yoshifumi: *See*—
Kamuro, Setsufumi; and Masaki, Yoshifumi, 4,482,822, Cl. 307-468.000.

Mashevich, Pavel R.: *See*—
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; and Chicherin, Jury E., 4,482,950, Cl. 364-200.000.

Mason, Murray R., to Canadian Fram Limited. Double active drive mechanism. 4,482,038, Cl. 192-48.200.

Mason, Rosetta; and Crowe, Ruthie J. Protective visor. 4,481,680, Cl. 2-174.000.

Massachusetts Institute of Technology: *See*—
Seyferth, Dietmar; and Wiseman, Gary H., 4,482,669, Cl. 524-442.000.

Mathewson Corporation: *See*—
Redman, Howard E.; and Snowman, Roger O., 4,482,044, Cl. 198-388.000.

Matouka, Michael F., to General Motors Corporation. Power steering gear with variable rate torsion bar for optimized steering. 4,481,866, Cl. 91-375.00A.

Matsuda, Minoru; Shinozaki, Takashi; and Kato, Kentaro, to Honda Giken Kogyo Kabushiki Kaisha. Supercharger apparatus for internal combustion engine in motorized two-wheeled vehicle. 4,482,024, Cl. 180-219.000.

Matsuda, Mutsuhide: *See*—
Tsuzuki, Hiroyoshi; Tokuda, Ryuji; and Matsuda, Mutsuhide, 4,482,236, Cl. 354-412.000.

Matsuda, Takashi, to Takaro Co., Ltd. Toy watch. 4,482,256, Cl. 368-10.000.

Matsuda, Yoshikazu: *See*—
Wada, Chuzoh; and Matsuda, Yoshikazu, 4,482,311, Cl. 431-15.000.

Matsueda, Yoshio: *See*—
Makabe, Hideki; Yamamoto, Toyoji; Matsueda, Yoshio; Ito, Yasunori; and Yamada, Katsuto, 4,482,245, Cl. 356-30.000.

Matsui, Kohichi; and Tanikawa, Kowji, to Olympus Optical Co., Ltd. Control circuit for a segmented display device. 4,482,894, Cl. 340-756.000.

Matsumoto, Akio: *See*—
Iwaki, Yoshiyuki; and Matsumoto, Akio, 4,482,830, Cl. 310-113.000.

Matsumoto, Masakatsu; and Ito, Satoru, to Sagami Chemical Research Center. Method for preparing benzoquinones. 4,482,493, Cl. 260-396.00R.

Matsumoto, Yoshihiro; Shinozaki, Masatoshi; and Irie, Toshio, to Kawasaki Steel Corporation. Spot-weldable lightweight composite material. 4,482,600, Cl. 428-213.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Habata, Etsuroh; Ohshima, Nobumasa; and Kanatani, Kenji, 4,482,801, Cl. 219-540.000.
Kawamura, Ichiro; Hino, Izumi; and Fujita, Makoto, 4,482,991, Cl. 369-77.200.
Wada, Chuzoh; and Matsuda, Yoshikazu, 4,482,311, Cl. 431-15.000.

Matsushita Electronics Corp.: *See*—
Nishikawa, Mikio; Fujii, Hiroyuki; Tateno, Kenichi; and Yokozawa, Masami, 4,482,915, Cl. 357-72.000.

Matsutani, Shigeru: *See*—
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Matsuura, Masataka: *See*—
Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, 4,482,212, Cl. 350-334.000.

Matterstock, Karl: *See*—
Handte, Reinhard; Matterstock, Karl; Bieringer, Hermann; and Kocher, Helmut, 4,482,373, Cl. 71-88.000.

Mattes, Dieter, to Sulzer Brothers, Ltd. Cooling system. 4,481,790, Cl. 62-238.600.

Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., to Bernard Matthews Limited. Apparatus for making a fab coated meat product. 4,481,872, Cl. 99-353.000.

Mattsson, Kjell: *See*—
Brattstrom, Leif; Mattsson, Kjell; and Arvidsson, Bertil, 4,481,886, Cl. 102-476.000.

Maulding, Donald R., to American Cyanamid Company. Procedure for preparing 1,3-diphenyl-1,3-propanedione. 4,482,745, Cl. 568-314.000.

Maurer, Dieter: *See*—
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, 4,482,025, Cl. 180-255.000.

May, George A. Video computing system with automatically refreshed memory. 4,482,979, Cl. 364-900.000.

Mayer, Edward: *See*—
Farrell, Gerald J.; and Mayer, Edward, 4,481,971, Cl. 137-315.000.

Mayer, James M., to Monsanto Company. Substituted-butanediperoxoic acids and process for bleaching. 4,482,349, Cl. 8-111.000.

Maynard, Richard B.; Moscony, John J.; and Saunders, Margaret H., to RCA Corporation. Method for etching apertures into a strip of nickel-iron alloy. 4,482,426, Cl. 156-640.000.

Mayska, Paul J.: *See*—
Serini, Volker; Mayska, Paul J.; Block, Hans-Dieter; and Freitag, Dieter, 4,482,693, Cl. 528-167.000.

Mazda Motor Corporation: *See*—
Iida, Katsuyoshi, 4,481,908, Cl. 123-1.00A.
Yamamoto, Yukio; and Yoritaka, Masashi, 4,482,396, Cl. 148-3.000.

McCain Manufacturing Corporation: *See*—
McCain, William B.; and Rankin, Todd S., 4,482,142, Cl. 270-54.000.

McCain, William B.; and Rankin, Todd S., to McCain Manufacturing Corporation. Method of signature collating of different editions. 4,482,142, Cl. 270-54.000.

McCluskey, Lincoln: *See*—
Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, 4,481,951, Cl. 128-516.000.

McDermott, Arthur W., to Boeing Company, The. Method of making a coil assembly for hot melt induction heater apparatus. 4,481,709, Cl. 29-611.000.

McDonnell, Damien G.: *See*—
Carr, Neil; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Raynes, Edward P., 4,482,472, Cl. 252-299.100.

McDonnell Douglas Corporation: *See*—
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,482,375, Cl. 75-0.50C.

McEwen, James P.: *See*—
Kiehl, William C.; and McEwen, James P., 4,482,258, Cl. 368-90.000.

McGinn, Joseph T.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., to RCA Corporation. Method for growing a low defect monocrystalline layer on a mask. 4,482,422, Cl. 156-612.000.

McHale, Angelika H.: *See*—
Falender, James R.; and McHale, Angelika H., 4,482,498, Cl. 260-429.500.

McKenzie, Lee F., to Hughes Tool Company. Polyamine fluid loss additive for oil well cements. 4,482,383, Cl. 106-90.000.

McKillop, Alexander: *See*—
Ballard, Roy E.; and McKillop, Alexander, 4,482,438, Cl. 204-78.000.

McMenamin, Francis E.: *See*—
Korowitz, Simon; and McMenamin, Francis E., 4,482,980, Cl. 364-900.000.

McNeil, Algernon. Tip ball game. 4,482,157, Cl. 273-411.000.

McNellis, Robert L.: *See*—
Emmett, Manley D.; and McNellis, Robert L., 4,482,580, Cl. 427-66.000.

McVey, Jack L. Apparatus for preventing unauthorized use of electrically powered equipment. 4,482,789, Cl. 200-44.000.

Mead Corporation, The: *See*—
Arney, Jonathan S.; Wright, Richard F.; Adair, Paul C.; and Williams, Dennis L., 4,482,624, Cl. 430-138.000.
Cooley, Jack S., 4,481,750, Cl. 53-398.000.
Milliens, Andre, 4,482,090, Cl. 229-40.000.

Mecan Arbed S.a.r.l.: *See*—
Reuter, Hans J., 4,482,002, Cl. 164-442.000.

Medtronic, Inc.: *See*—
Duggan, Stephen R., 4,481,950, Cl. 128-419.0PT.

Meggs, Daniel H., to Gulf & Western Manufacturing Company. Water activated inflation mechanism. 4,482,081, Cl. 222-5.000.

Meijer, Roelf J.; and Ziph, Benjamin, to Stirling Thermal Motors, Inc. Heat exchanger stack apparatus. 4,481,771, Cl. 60-517.000.

Meissner, Hans-Jurgen: *See*—
Freitag, Dieter; Hucks, Uwe; and Meissner, Hans-Jurgen, 4,482,694, Cl. 528-176.000.

Melbye, Hartvig E.; and Jacoby, George V., to Sperry Corporation. Ternary magnetic recording and reproducing system with simultaneous overwrite. 4,482,927, Cl. 360-40.000.

Meltz, Gerald; Newman, Leon A.; Dunphy, James R.; and Foster, Martin C., to United Technologies Corporation. Forward scattering laser particulate sensor. 4,482,247, Cl. 356-343.000.

Menconi, Augusto: *See*—
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; and Logoni, Angelo, 4,482,570, Cl. 424-304.000.

Menick, Ralph E., to Motorola, Inc. Differential ECD detector for Loran C receiver. 4,482,896, Cl. 343-390.000.

Menzi, Ernst, to Ernst Menzi AG. Excavator. 4,482,287, Cl. 414-694.000.

Mercer, Lucia: *See*—
Zelkowitz, Hyman L.; Crawford, Jeffrey D.; and Mercer, Lucia, 4,482,119, Cl. 248-188.000.

Merck & Co., Inc.: *See*—
Bochis, Richard J.; and Dewey, Ray S., 4,482,545, Cl. 424-181.000.

Merck Patent Gesellschaft mit Beschrankter Haftung: *See*—
Franz, Klaus-Dieter; Ambrosius, Klaus; Esselborn, Reiner; and Kieser, Manfred, 4,482,389, Cl. 106-291.000.

Mercx, Josef: *See*—
Glattfelder, Adolf; Guttinger, Heinz; and Mercx, Josef, 4,481,799, Cl. 72-8.000.

Meretsky, Paul L., to Technion Research and Development Foundation, Ltd. Battery charger. 4,482,856, Cl. 320-59.000.

Merger, Franz; Nestler, Gerhard; Platz, Rolf; Towae, Friedrich; and Heilbach, Hans, to BASF Aktiengesellschaft. Process for the preparation of isocyanates by thermal cleaving of urethanes. 4,482,499, Cl. 260-453.00P.

Meslink, Michael C.: *See*—
Mulder, James P.; and Meslink, Michael C., 4,481,728, Cl. 37-142.00A.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Meyer, Jochen; and Wilde, Richard, 4,481,902, Cl. 116-212.000.

Meszaros, Zoltan: *See*—
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,482,557, Cl. 424-251.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Stonner, Hans-Martin, 4,482,766, Cl. 568-885.000.

Metallurgie Hoboken-Overpelt: *See*—
Verhoeven, Constant T.; Viellefont, Jean-Francois; and Dierckxsens, Robert, 4,481,963, Cl. 134-104.000.

Metric Corporation: *See*—
Schad, Charles A., 4,481,806, Cl. 73-3.000.

Metro-Tel Corp.: *See*—
Flynn, Arthur, Jr., 4,482,786, Cl. 179-90.00B.

Metz, Pierre, to Thomson-Brandt. Control device using gas jets for a guided missile. 4,482,107, Cl. 244-3.220.

Meyer, Gerhard A.; and Barnes, Ramon M. Inductively coupled plasma discharge in flowing non-argon gas at atmospheric pressure for spectrochemical analysis. 4,482,246, Cl. 356-316.000.

Meyer, Jochen; and Wilde, Richard, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Method and apparatus for testing overlapping connections in structural components. 4,481,902, Cl. 116-212.000.

Meyers, Louis B. Method and apparatus for making carbonated beverages. 4,481,986, Cl. 141-4.000.

Michaelson, Robert C.: *See*—
Austin, Richard G.; and Michaelson, Robert C., 4,482,763, Cl. 568-860.000.

Michelson, Gary K. Orthopedic support frame. 4,481,943, Cl. 128-134.000.

Microdot Inc.: *See*—
Huntsberry, David L., 4,482,062, Cl. 211-57.100.

Middleton, John D., to Marconi Instruments Limited. Swept frequency oscillators having time constant-controlled signal level detector. 4,482,872, Cl. 331-178.000.

Migis, Ronald: *See*—
Enk, William A.; and Migis, Ronald, 4,482,018, Cl. 169-52.000.

Mihara, Kuniyuki: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,481,742, Cl. 51-165.800.

Mijovic, Miroslav V.: *See*—
Twist, Peter J.; Bailey, Joseph; Briggs, Stuart P.; Mijovic, Miroslav V.; and Southby, David T., 4,482,626, Cl. 430-380.000.

Miki, Nobuaki; Sobue, Norio; and Yokoyama, Shoji, to Aisin Warner Kabushiki Kaisha. Reduction ratio detecting mechanism for V-belt type continuously variable transmission. 4,482,339, Cl. 474-28.000.

Miki, Takao; Asayama, Yoshiaki; and Ueyama, Yoshiji, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection system for an internal combustion engine. 4,481,926, Cl. 123-463.000.

Miki, Takao; and Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for supplying fuel into an internal combustion engine. 4,481,927, Cl. 123-478.000.

Miles Laboratories, Inc.: *See*—
Siddiqi, M. Sultan, 4,482,583, Cl. 427-284.000.

Milkowski, Wolfgang: *See*—
Roemer, Dietmar; Ruhland, Michael; Zeugner, Horst; Milkowski, Wolfgang; and Liepmann, Hans, 4,482,548, Cl. 424-244.000.

Miller, Charles H., to Eterna-Tec Corporation. Cementitious compositions and methods of making same. 4,482,384, Cl. 106-92.000.

Miller, Robert C.: *See*—
Peterson, Charles A.; Grove, Louis C., Jr.; Miller, Robert C.; and Oates, Robert M., 4,482,930, Cl. 361-16.000.

Miller, Robert F., to Allegheny Ludlum Steel Corporation. Method for producing cube-on-edge oriented silicon steel. 4,482,401, Cl. 148-111.000.

Milliens, Andre, to Mead Corporation, The. Package sleeve with gusset panel for tightening sleeve and reinforcing a handle. 4,482,090, Cl. 229-40.000.

Milliken Research Corporation: *See*—
Wilson, Michael E., 4,482,655, Cl. 523-200.000.

Milo, August. Tank fill cap locking system. 4,481,797, Cl. 70-167.000.

Minamisawa, Tsuyoshi; and Andoh, Masato, to Toho Beslon Co., Ltd. Prepreg for making a composite having high elongation and heat resistance and process for making such composite with the prepreg. 4,482,660, Cl. 523-428.000.

Mincey, Christopher D. Portable folding chair. 4,482,184, Cl. 297-28.000.

Mindt, Wolfgang: *See*—
Eberhard, Patrick; Mindt, Wolfgang; Palma, Jean-Pierre; Schafer, Robert; and Scharf, Robert, 4,481,804, Cl. 73-1.00G.

Mink, Bernardus H., to Shell Oil Company. Process for the cooling and separating of small particle-containing gases. 4,482,363, Cl. 55-69.000.

Minne, Jean-Claude, to Schlumberger Technology Corporation. Well logging: utilizing superposition of step-profile responses of logging tools to improve logs. 4,482,959, Cl. 364-422.000.

Minneman, William J., to MTM Molded Products Company. Combination walking stick and shooting rest. 4,481,964, Cl. 135-66.000.

Minnesota Mining and Manufacturing Company: *See*—
Bunker, James E., 4,482,505, Cl. 260-952.000.
Isbrandt, Russell R., 4,482,608, Cl. 428-421.000.
Rubertus, Roland W.; and Tait, William C., 4,482,874, Cl. 333-185.000.

Minolta Camera Kabushiki Kaisha: *See*—
Yuasa, Yoshio; Naruse, Kazuhiko; and Kawagoe, Nobukazu, 4,482,978, Cl. 364-900.000.

Minton, Paul, to Rival Manufacturing Company. Shaded pole motor lamination. 4,482,832, Cl. 310-216.000.

Miribel, Wolfgang: *See*—
Brobeck, Helmut; Ludewig, Hartmut; Miribel, Wolfgang; and Stonner, Helmut, 4,482,304, Cl. 417-407.000.

Mitchell, James K.; and Kao, Tsung-chung, to University of California, Regents of the. Backfilling material and method of preparation thereof. 4,482,271, Cl. 405-157.000.

Mitchell, John D., to Boeing Company, The. Method of assembling threaded insert bushing within a working material. 4,481,702, Cl. 29-432.000.

Mitchell, Kim W., to United States of America, Energy. Solar cells with low cost substrates and process of making same. 4,482,780, Cl. 136-258.000.

Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Organic compound conversion. 4,482,752, Cl. 585-670.000.

Mito, Yasuhiro; and Iwasaki, Hideo, to Shimadzu Corporation. Detector for chromatographs. 4,482,966, Cl. 364-498.000.

Mitsubishi Chemical Industries, Limited: *See*—
Imahori, Seiichi; Niwa, Toshio; Okada, Itaru; and Sato, Kuninori, 4,482,490, Cl. 534-797.000.
Kudomi, Hiroyuki; and Sato, Shinichi, 4,482,682, Cl. 525-369.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
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Miki, Takao; Asayama, Yoshiaki; and Ueyama, Yoshiji, 4,481,926, Cl. 123-463.000.
Miki, Takao; and Asayama, Yoshiaki, 4,481,927, Cl. 123-478.000.
Nomaguchi, Tamotsu; and Sakai, Masahiro, 4,482,008, Cl. 165-29.000.
Ohta, Yoshihiro; Kawakami, Hidenori; and Tsuruta, Keiji, 4,482,880, Cl. 336-217.000.
Okada, Kazuo; and Imado, Fumiaki, 4,482,987, Cl. 369-44.000.
Saito, Kouji, 4,482,936, Cl. 361-336.000.
Yoshida, Masayuki; Nomura, Masami; and Ikejima, Hiroyuki, 4,482,031, Cl. 187-29.00R.
Yoshino, Hozo, 4,481,788, Cl. 62-181.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Akimoto, Ryosaku; and Ito, Nobuaki, 4,481,789, Cl. 62-209.000.
Ishitani, Kenichiro; Hamasaki, Toshiharu; Shiomi, Shoji; and Kawamura, Eiichi, 4,482,158, Cl. 277-3.000.
Ishitani, Kenichiro; and Kawamura, Eiichi, 4,482,159, Cl. 277-3.000.
Nagase, Yukihiko; Kawasaki, Tetsuo; Hiromatsu, Masato; Asanabe, Sadao; and Saki, Kunio, 4,481,867, Cl. 91-487.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Katsura, Toru; and Kubbota, Massashi, 4,482,628, Cl. 430-538.000.

Mitsui Toatsu Chemicals Inc.: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; and Tanabe, Yoshimitsu, 4,482,742, Cl. 564-412.000.

Miutel, Alexander; and Shira, Jerry P., to Phoenix Foam Inc. Plastics cellular material and method of making. 4,482,649, Cl. 521-86.000.

Miyagawa, Hiroshi; and Kano, Masayuki, to Kabushiki Kaisha Meidensha. Vacuum interrupter. 4,482,790, Cl. 200-144.00B.

Miyai, Akira: *See*—
Wada, Tetsuya; Ishii, Masaji; Miyai, Akira; and Hagiwara, Hirotoshi, 4,482,839, Cl. 313-346.00R.

Miyasaka, Hiroshi: *See*—
Makuta, Shunichi; Miyasaka, Hiroshi; and Takebe, Katsuhiko, 4,481,852, Cl. 84-1.030.

Mizoguchi, Shozo: *See*—
Nakano, Taketo; Fuji, Masao; and Mizoguchi, Shozo, 4,482,003, Cl. 164-452.000.

Mizuguchi, Hiroyuki, to Yamada Dobby Co., Ltd. Heald frame driving method in negative dobby machines or cam machines. 4,481,979, Cl. 139-84.000.

Mizuguchi, Jin; Sumi, Koichiro; Muchi, Tsuneo; and Soyama, Shinichi, to Sony Corporation. Nonaqueous suspension for electrophoretic deposition of powders. 4,482,447, Cl. 204-181.00N.

Mizuguchi, Kazuhiko: *See*—
Nishikawa, Kazuyuki; Hirao, Katsumi; Mizuguchi, Kazuhiko; and Suzuki, Hiroshi, 4,482,654, Cl. 523-145.000.

Mizunuma, Masanori; and Watanabe, Hiroyuki, to Tomy Kogyo Co., Inc. Game apparatus with moving objects. 4,482,154, Cl. 273-153.00S.

Mizuta, Takemi: *See*—
Tateishi, Iwao; Mizuta, Takemi; Yokoyama, Tatuo; and Kakutani, Nobuyasu, 4,482,965, Cl. 364-467.000.

Mizutani, Takashi: *See*—
Ohodaira, Takeo; and Mizutani, Takashi, 4,482,585, Cl. 428-35.000.

Mobil Oil Corporation: *See*—
Audeh, Costandi A., 4,482,744, Cl. 568-60.000.
Chu, Yung F.; Smith, Fritz A.; and Chester, Arthur W., 4,482,773, Cl. 585-481.000.
Kuehl, Guenter H., 4,482,531, Cl. 423-329.000.
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,482,752, Cl. 585-670.000.
Tabak, Samuel A., 4,482,772, Cl. 585-254.000.

Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, to Mochida Pharmaceutical Co., Ltd. Method for reacting solid and liquid phases. 4,482,636, Cl. 436-518.000.

Mochida, Haruo, to Nissan Motor Company, Limited. Alarm system for an automatic transmission. 4,482,885, Cl. 340-52.00R.

Mochida Pharmaceutical Co., Ltd.: *See*—
Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, 4,482,636, Cl. 436-518.000.

Mohr, Dieter: *See*—
Frass, Werner; and Mohr, Dieter, 4,482,444, Cl. 204-129.350.

Monsanto Company: *See*—
Donermeyer, Donald D.; Martins, Joseph G.; and Fabel, David A., 4,482,604, Cl. 428-336.000.
Mayer, James M., 4,482,349, Cl. 8-111.000.

Montedison, S.p.A.: *See*—
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; and Logoni, Angelo, 4,482,570, Cl. 424-304.000.

Moody, Roy A.: *See*—
Caveney, Jack E.; Moody, Roy A.; and Bulanda, John J., 4,481,710, Cl. 29-749.000.

Moots, Paul C.: *See*—
Lohbauer, Kenneth R.; and Moots, Paul C., 4,481,770, Cl. 60-452.000.

Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Device and method for stripping developer from a photoconductive surface. 4,482,241, Cl. 355-10.000.

Moraw, Roland; and Schaedlich, Guenther, to Hoechst Aktiengesellschaft. Device and method for stripping developer liquid from a photoconductive surface. 4,482,242, Cl. 355-10.000.

Morgan, Burton D., to Top Roc Precast Corporation. Seawall barrier. 4,482,269, Cl. 405-29.000.

Morganite Special Carbons Limited: *See*—
Alsop, John E., 4,482,512, Cl. 264-29.100.

Mori, Masami: *See*—
Nishimura, Masao; Mori, Masami; and Kai, Yasuhito, 4,482,009, Cl. 165-41.000.

Mori, Shigeo: *See*—
Asahi, Satoshi; Mori, Shigeo; and Takeshita, Yasuhiro, 4,482,686, Cl. 526-119.000.

Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Apparatus for producing composite pipes. 4,482,420, Cl. 156-392.000.

Morimoto, Kazuo: *See*—
Funakoshi, Satoshi; Morimoto, Kazuo; Kuboyama, Morio; Yanai, Nobuya; Yamada, Muneo; and Yokota, Hajime, 4,482,485, Cl. 260-112.00R.

Morimoto, Masafumi; Yanagiuchi, Shigenobu; and Akizuki, Noboru, to Sharp Kabushiki Kaisha. Input device for pocket electronic translator. 4,482,981, Cl. 364-900.000.

Morinaga Milk Industry Co., Ltd.: *See*—
Funakoshi, Satoshi; Morimoto, Kazuo; Kuboyama, Morio; Yanai, Nobuya; Yamada, Muneo; and Yokota, Hajime, 4,482,485, Cl. 260-112.00R.

Morishita, Hirosada: *See*—
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, 4,482,703, Cl. 528-322.000.

Morishita, Tuyoshi; Hattori, Toshihiko; Kawado, Yashuhumi; and Tarumoto, Kouji, to Toyo Kogyo Co., Ltd. Nitrided cast iron product and method for manufacturing the same. 4,482,399, Cl. 148-31.500.

Morita, Tadashi: *See*—
Koizumi, Hideo; Koseki, Isamu; Morita, Tadashi; Yamazaki, Shu; and Fukuhara, Yoshio, 4,482,837, Cl. 378-144.000.

Morita, Toru: *See*—
Ushio, Masaru; Morita, Toru; Ishii, Takeshi; and Oishi, Yasuyuki, 4,482,450, Cl. 208-152.000.

Moriya, Kikuo: *See*—
Sakurai, Nobuo; and Moriya, Kikuo, 4,481,845, Cl. 83-13.000.

Moriya, Ryusuke; Eguchi, Takeo; and Ohba, Takeo, to Sony Corporation. Tracking control system for magnetic recording and reproducing system. 4,482,928, Cl. 360-77.000.

Morris, Karl J., to Alexis Fire Equipment Co. Liquid supply tank. 4,482,017, Cl. 169-24.000.

Morrison, Thomas R.: *See*—
Blasnik, William, 4,481,901, Cl. 116-28.100.

Mort, Charles B.; and DeSalve, Dennis W., to United Aircraft Products, Inc. Sealing mechanical tube joints. 4,482,415, Cl. 156-91.000.

Mortensen, James W. Manhole lid lifter. 4,482,182, Cl. 294-15.000.

Morton, Anthony J.: *See*—
Hayes, Harry; Morton, Anthony J.; and Harvey, Kenneth, 4,482,536, Cl. 424-52.000.

Morton, Paul G., to Triumph Motorcycles (Meriden) Limited. Means for reducing vibration in reciprocating engines. 4,481,918, Cl. 123-192.00B.

Moscony, John J.: *See*—
Maynard, Richard B.; Moscony, John J.; and Saunders, Margaret H., 4,482,426, Cl. 156-640.000.

Moser, James R., to Stobb, Inc. Method and apparatus for conveying folded sheets using orbitally gripping and releasing clamp pads. 4,482,141, Cl. 270-54.000.

Moses, Peter R.: *See*—
Turchan, Michael J., deceased; Moses, Peter R.; and Taylor, Alwyn H., 4,482,613, Cl. 429-53.000.

Mosimann, John G.; and Wassell, Mark E., to Terry Corporation. Bladed rotor assembly. 4,482,297, Cl. 416-218.000.

Mosimann, John G.: *See*—
Wassell, Mark E.; and Mosimann, John G., 4,482,296, Cl. 416-215.000.

Motor Wheel Corporation: *See*—
Strader, Don S., 4,481,997, Cl. 152-401.000.

Motorola, Inc.: *See*—
Brown, Daniel P., 4,483,011, Cl. 375-25.000.
Cates, Ronnie L., 4,482,949, Cl. 364-200.000.
King, Thomas M.; Champlin, Cary R.; and Daniel, Sam M., 4,482,975, Cl. 364-608.000.
Menick, Ralph E., 4,482,896, Cl. 343-390.000.
Stringfellow, Martin S., 4,482,871, Cl. 331-101.000.
Whatley, Roger A., 4,482,868, Cl. 330-274.000.

Motozo, Yasuno: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda. 4,482,275, Cl. 406-12.000.

Motta, Gianni: *See*—
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; and Graziani, Gabriele, 4,482,561, Cl. 424-258.000.

Motte, Klaus B., to General Motors Corporation. Soft edge seat belt webbing. 4,481,981, Cl. 139-426.00R.

Moulin, Michel: *See*—
Moyroud, Louis M.; Bongard, Michel; Vernez, Paul A.; and Moulin, Michel, 4,482,225, Cl. 354-5.000.

Moyroud, Louis M.; Bongard, Michel; Vernez, Paul A.; and Moulin, Michel, to Autologic, S.A. Photocomposing machine and method. 4,482,225, Cl. 354-5.000.

MPD Technology Corporation: *See*—
Osborn, Donald H.; and Basley, Richard J., 4,482,374, Cl. 75-0.50R.

MSK-Verpackungs-Systeme Gesellschaft m.b.H.: *See*—
Hannen, Rainer, 4,481,754, Cl. 53-567.000.

MTM Molded Products Company: *See*—
Minneman, William J., 4,481,964, Cl. 135-66.000.

Much, Gerd: *See*—
Hill, Bernhard; and Much, Gerd, 4,482,214, Cl. 350-355.000.

Muchi, Tsuneo: *See*—
Mizuguchi, Jin; Sumi, Koichiro; Muchi, Tsuneo; and Soyama, Shinichi, 4,482,447, Cl. 204-181.00N.

Mueller, Hans R.: *See*—
Janson, Philippe A.; Mueller, Hans R.; and Sze, Daniel T. W., 4,482,999, Cl. 370-86.000.

Mueller, John: *See*—
Wildmoser, Martin M., 4,482,282, Cl. 414-404.000.

Muench, Volker: *See*—
Hambrecht, Juergen; Reffert, Rudi W.; Muench, Volker; Echte, Adolf; and Swoboda, Johann, 4,482,705, Cl. 528-486.000.

Mukerjee, Ajit K., to BOC Group, Inc., The. Methods and apparatus for refrigerating products. 4,481,782, Cl. 62-63.000.

Mulder, James P.; and Meslink, Michael C., to Abex Corporation. Dipper tooth tip and adapter. 4,481,728, Cl. 37-142.00A.

Mulet-Marquis, Yves H.: *See*—
Tardieu, Pierre R.; and Mulet-Marquis, Yves H., 4,482,829, Cl. 310-105.000.

Mullen, Terrence J.: *See*—
Steingraber, Gary C.; and Mullen, Terrence J., 4,481,906, Cl. 119-14.320.

Muller, Eberhard: *See*—
Musch, Rudiger; Gobel, Wilhelm; Muller, Eberhard; and Konter, Wolfgang, 4,482,676, Cl. 525-215.000.

Muller, Hanns-Peter: *See*—
Wegner, Christian; Muller, Hanns-Peter; and Kreuder, Hans J., 4,482,721, Cl. 548-262.000.

Muller, Peter R.: *See*—
Neuray, Dieter; Nouvertne, Werner; Binsack, Rudolf; Rempel, Dieter; and Muller, Peter R., 4,482,672, Cl. 525-67.000.

Muller, Rolf: *See*—
Doemen, Benno; and Muller, Rolf, 4,482,849, Cl. 318-254.000.

Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, to Hitachi Shipbuilding & Engineering Co., Ltd. Slurry carrying ship. 4,481,898, Cl. 114-74.00R.

Murakami, Kotaro: *See*—
Tomimatsu, Toshiaki; and Murakami, Kotaro, 4,482,706, Cl. 536-6.100.

Murata Kikai Kabushiki Kaisha: *See*—
Kimura, Hidetoshi, 4,481,761, Cl. 57-22.000.

Murata Manufacturing Co., Ltd.: *See*—
Hirota, Toshiharu; Kano, Osamu; and Kato, Yoshiharu, 4,482,934, Cl. 361-321.000.

Murphy, Charles J. Feed chopping knife. 4,482,098, Cl. 241-292.100.

Murphy, Donald G. Earth surface cleaning machine. 4,482,019, Cl. 171-63.000.

Murphy, Robert P., Jr.: *See*—
Wagner, Ovner R., Jr.; Murphy, Robert P., Jr.; Dauben, Dwight L.; and Smith, Roger L., 4,482,806, Cl. 250-260.000.

Murzyn, Patrick J.: *See*—
Pollock, Charles B.; Murzyn, Patrick J.; Brennom, Stephen O.; and Lambert, James N., 4,482,392, Cl. 134-7.000.

Musch, Rudiger; Gobel, Wilhelm; Muller, Eberhard; and Konter, Wolfgang, to Bayer Aktiengesellschaft. Production of sulfur-modified solid chloroprene rubbers. 4,482,676, Cl. 525-215.000.

Musil, Joseph E., to Iowa Manufacturing Company of Cedar. Portable asphalt storage silo. 4,482,281, Cl. 414-332.000.

Muskovac, Nicholas G., to Westinghouse Electric Corp. Motor slip controller for AC motors. 4,482,852, Cl. 318-729.000.

Muto, Naoki: *See*—
Sakakibara, Hideo; Satoi, Shuzo; Awata, Masashi; Sagai, Hitoshi; Hayashi, Mitsuo; Muto, Naoki; and Takada, Masaki, 4,482,707, Cl. 536-16.800.

Mutsukura, Kouji: *See*—
Tsukahara, Kenji; Mutsukura, Kouji; and Inoue, Takayoshi, 4,481,921, Cl. 123-304.000.

MWL Tool & Supply Company: *See*—
Allwin, Roger P., 4,482,014, Cl. 166-136.000.

N. V. Bekaert S.A.: *See*—
De Bondt, Marc; D'Haene, Urbain; and Dambre, Paul, 4,481,996, Cl. 152-359.000.

Nagahara, Yoshikazu, to Kabushiki Kaisha Komatsu Seisakusho. Control system for hydraulically driven vehicles. 4,481,769, Cl. 60-441.000.

Nagahira, Jyoji: *See*—
Suzuki, Koji; Kuroda, Kouki; and Nagahira, Jyoji, 4,482,243, Cl. 355-14.00D.

Nagakura, Masahiko: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

Nagao, Tsukasa. Optical glass fiber transmission lines coupled junction circulators. 4,482,202, Cl. 350-96.150.

Nagase, Yukihiko; Kawasaki, Tetsuo; Hiromatsu, Masato; Asanabe, Sadao; and Saki, Kunio, to Mitsubishi Jukogyo Kabushiki Kaisha. Axial plunger pump or motor. 4,481,867, Cl. 91-487.000.

Nagashima, Hideyuki; and Okuyama, Hiroo, to Nissan Motor Co., Ltd. Belt guide structure. 4,482,187, Cl. 297-468.000.

Nagler, Albert. Plossl type eyepiece for use in astronomical instruments. 4,482,217, Cl. 350-410.000.

Nagy, Balint: *See*—
Pais, Istvan; Feher nee Ravasz, Magda; Nagy, Balint; Bokori, Jozsef; and Szabo, Zoltan, 4,482,550, Cl. 424-245.000.

Nagy, David L., to Domenjoud, Daniel F., a part interest. Striker plate and security pin for dead bolt lock. 4,482,177, Cl. 292-156.000.

Nahas, Randall E.: *See*—
Stevenson, Ernest W.; and Nahas, Randall E., 4,482,268, Cl. 405-3.000.

Nakagawa, Kazuyuki: *See*—
Banno, Kazuo; Fujioka, Takafumi; Oshiro, Yasuo; and Nakagawa, Kazuyuki, 4,482,560, Cl. 424-258.000.

Nakagawa, Satoshi; Sugita, Hiroshi; Kida, Shuzi; Uemura, Morito; and Kishi, Ken-ichi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,482,629, Cl. 430-542.000.

Nakai, Takeshi: *See*—
Ishikawa, Nobuo; and Nakai, Takeshi, 4,482,729, Cl. 556-446.000.

Nakai, Yasuo: *See*—
Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,481,898, Cl. 114-74.00R.

Nakajima, Fumito: *See*—
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, 4,482,479, Cl. 252-630.000.

Nakamura, Tadamitsu; Iwamoto, Yogaku; Kadotani, Kanichi; and Marui, Tokuo, to Dainichiseika Colour & Chemicals Mfg. Co., Ltd.; and Kabushiki Kaisha Komatsu Seisakusho. Liquid for absorption of solar heat. 4,482,467, Cl. 252-70.000.

Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, to Toyota Jidosha Kabushiki Kaisha. Helically-shaped intake port of an internal combustion engine. 4,481,915, Cl. 123-188.00M.

Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, to Toyota Jidosha Kabushiki Kaisha. Helically-shaped intake port of an internal combustion engine. 4,481,916, Cl. 123-188.00M.

Nakano, Hiroshige: *See*—
Kurosawa, Makoto; Nakano, Hiroshige; Hosoya, Kensei; and Kobayashi, Tsuneki, 4,481,880, Cl. 101-93.040.

Nakano, Taketo; Fuji, Masao; and Mizoguchi, Shozo, to Nippon Steel Corporation. Method for continuous casting of steel. 4,482,003, Cl. 164-452.000.

Nakano, Yoshiyuki: *See*—
Kato, Hironobu; Ichikawa, Masaru; Sano, Atsushi; Tanabe, Yoshiaki; and Nakano, Yoshiyuki, 4,482,231, Cl. 354-246.000.

Nakao, Hideo: *See*—
Fujimoto, Koichi; Nakayama, Eiji; and Nakao, Hideo, 4,482,710, Cl. 544-28.000.

Nakayama, Akira: *See*—
Iwataki, Isao; Nakayama, Akira; Kaeriyama, Minoru; Ishikawa, Hisao; Hosaka, Hideo; Kohara, Kenichi; and Yamada, Shozo, 4,482,740, Cl. 564-99.000.

Nakayama, Eiji: *See*—
Fujimoto, Koichi; Nakayama, Eiji; and Nakao, Hideo, 4,482,710, Cl. 544-28.000.

Nakayama, Nobutoshi; Ito, Yukinobu; Nishihara, Eitaro; Iwata, Kazuhide; and Shibayama, Shigeki, to Tokyo Shibaura Denki Kabushiki Kaisha. Data processing device for computed tomography system. 4,482,958, Cl. 364-414.000.

Namiki, Tomizo; Tago, Tomohisa; Totsuka, Mikio; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Process for preparing a color proofing sheet. 4,482,625, Cl. 430-143.000.

Nanya, Takanori: *See*—
Hashimoto, Eigo; and Nanya, Takanori, 4,482,216, Cl. 350-357.000.

Nara, Seietsu: *See*—
Horii, Tetsuo; Nara, Seietsu; and Haruki, Kazuhito, 4,482,059, Cl. 209-569.000.

Narasimhan, Tanjore R.: *See*—
Bokil, Delip R.; and Narasimhan, Tanjore R., 4,481,708, Cl. 29-588.000.

Narayan, Thirumurti: *See*—
Reichel, Curtis J.; Patton, John T., Jr.; and Narayan, Thirumurti, 4,482,651, Cl. 521-115.000.

Nardi, Dante; Motta, Gianni; Testa, Rodolfo; and Graziani, Gabriele, to Recordati, S. A., Chemical & Pharmaceutical Co. Therapeutically effective piperidyl N-(4-quinolyl)-anthraniloyloxyalkanoates. 4,482,561, Cl. 424-258.000.

Naruo, Kyoichi: *See*—
Okita, Tsutomu; and Naruo, Kyoichi, 4,482,610, Cl. 428-483.000.
Naruse, Kazuhiko: *See*—
Yuasa, Yoshio; Naruse, Kazuhiko; and Kawagoe, Nobukazu, 4,482,978, Cl. 364-900.000.
Nast, Roland: *See*—
Hetzel, Hartmut; Gupta, Pramod; Nast, Roland; Echterhof, Herbert; and Brocker, Ulrich, 4,482,750, Cl. 568-621.000.
National Distillers and Chemical Corporation: *See*—
Smith, David W., 4,482,647, Cl. 518-701.000.
National Enclosure Systems, Inc.: *See*—
Rebhan, James R.; Rebhan, John C.; and Hallstrom, Arthur, 4,481,737, Cl. 49-385.000.
National Research Development Corporation: *See*—
Ballard, Roy E.; and McKillop, Alexander, 4,482,438, Cl. 204-78.000.
National Research Institute for Metals: *See*—
Uda, Masahiro; Ohno, Satoru; and Hoshi, Tutomu, 4,482,134, Cl. 266-217.000.
National Semiconductor Corporation: *See*—
Burns, Carmen D., 4,482,781, Cl. 174-52.0FP.
Natkai, Lajos; and Ujfelusi, Elek, to Orszagos Koolaj es Gazipari Troszt. Axial flow apparatus with rotating helical chamber and spindle members. 4,482,305, Cl. 418-48.000.
Nauchno-Issledovatelsky Institut Introskopii: *See*—
Kljuev, Vladimir V.; Kozlov, Valery P.; Degterev, Alexandr P.; Vainberg, Irina A.; Demidov, Vladimir V.; and Filimonov, Anatoly N., deceased, 4,481,825, Cl. 73-655.000.
NCR Corporation: *See*—
Shawen, Harley J.; and Marvin, Richard P., 4,482,057, Cl. 209-534.000.
Neat Products, Inc.: *See*—
Greck, Edward T., 4,481,874, Cl. 99-419.000.
Nederlandse Centrale Organisatie Voor Toegepastnatuurweten-Schappelijk Onderzoek: *See*—
Bulten, Eric J.; and Verbeek, Francois, 4,482,569, Cl. 424-287.000.
Neelameggham, Ramaswami; and Priscu, John C., to Amax Inc. Method for coating magnesium granules with fluoride-containing flux. 4,482,607, Cl. 428-403.000.
Nelson, Bertel S., to Wedgtrac Corporation. Torque limit drive transmission. 4,481,842, Cl. 74-798.000.
Nelson Industries, Inc.: *See*—
Roberts, Mark T., 4,482,368, Cl. 55-480.000.
Nelson, Ronald J.: *See*—
Besomi, Paul R.; Nelson, Ronald J.; and Wilson, Randall B., 4,482,423, Cl. 156-622.000.
Nelson, Stephen C. Automatic pipe tally device. 4,481,714, Cl. 33-141.00R.
Nemaco Trading Limited: *See*—
Smits, Johan G.; de Weerd, Johan A.; and Vuyk, Cor K., 4,481,745, Cl. 52-220.000.
Nestler, Gerhard: *See*—
Merger, Franz; Nestler, Gerhard; Platz, Rolf; Towae, Friedrich; and Hellbach, Hans, 4,482,499, Cl. 260-453.00P.
Neuray, Dieter; Nouvertne, Werner; Binsack, Rudolf; Rempel, Dieter; and Muller, Peter R., to Bayer Aktiengesellschaft. Thermoplastic moulding compositions of polycarbonate, polyalkylene terephthalate, graft copolymer and polyethylene. 4,482,672, Cl. 525-67.000.
Neuzil, Richard W., to UOP Inc. Separation of ortho bi-alkyl substituted monocyclic aromatic isomers. 4,482,777, Cl. 585-828.000.
New Product, Inc.: *See*—
Vadnais, Kenneth, 4,482,116, Cl. 248-99.000.
Newman, Leon A.: *See*—
Meltz, Gerald; Newman, Leon A.; Dunphy, James R.; and Foster, Martin C., 4,482,247, Cl. 356-343.000.
Newman, Stephen C.: *See*—
Bowman, Jeffery B.; Hubis, Daniel E.; Lewis, James D.; Newman, Stephen C.; and Staley, Richard A., 4,482,516, Cl. 264-127.000.
Newpark Waste Treatment Systems Inc.: *See*—
Shiver, Carolyn, 4,482,459, Cl. 210-639.000.
NGK Spark Plug Co., Ltd.: *See*—
Sakai, Masao; Suzuki, Yasuhiko; and Sugimoto, Makoto, 4,482,475, Cl. 252-506.000.
Nguyen, Nicolas C. 3', 5'-Dinucleoside phosphates of 5,6-dichloro-1-β-D-ribofuranosyl-1-benzimidazole and methods of making and using the same. 4,482,708, Cl. 536-28.000.
Nguyen, Van T.; Bellmann, Gunter; and Armanet, Jean-Michel, to Battelle Development Corporation. Method for manufacturing a composition for coating substrates with an abrasion-resistant transparent and translucent film. 4,482,656, Cl. 523-212.000.
Nicol, Roger: *See*—
Rovel, Jean-Marie; Prevot, Claude; and Nicol, Roger, 4,482,458, Cl. 210-603.000.
Nicolai, Franz: *See*—
Hess, Walter; Nicolai, Franz; and Gotting, Otto, 4,482,584, Cl. 427-286.000.
Nicolas, Edgard: *See*—
Indeherbergh, Jean; and Nicolas, Edgard, 4,482,441, Cl. 204-128.000.
Nieder, Erin G.: *See*—
Stephens, William D.; and Nieder, Erin G., 4,482,406, Cl. 149-19.400.
Niertit, Frank: *See*—
Brightman, Barrie; Niertit, Frank; and Hartman, Joseph A., 4,482,817, Cl. 307-257.000.
Nihei, Ryo: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,482,289, Cl. 414-736.000.
Nippon Electric Co., Ltd.: *See*—
Akagi, Masanobu, 4,482,952, Cl. 364-200.000.
Ishikawa, Shigeta, 4,482,994, Cl. 370-3.000.
Tsugane, Shuzo, 4,482,886, Cl. 340-347.0DD.
Yamamoto, Kazuhiro; and Atobe, Masaaki, 4,483,000, Cl. 370-95.000.
Nippon Interphone Co. Ltd.: *See*—
Yoshida, Shinichi; and Kobayashi, Kazutaka, 4,482,920, Cl. 358-228.000.
Nippon Kogaku K.K.: *See*—
Kato, Hironobu; Ichikawa, Masaru; Sano, Atsushi; Tanabe, Yoshiaki; and Nakano, Yoshiyuki, 4,482,231, Cl. 354-246.000.
Magariyama, Kenichi; Kimura, Makoto; and Terunuma, Hiroshi, 4,482,230, Cl. 354-219.000.
Takagi, Tadao; and Okabe, Nobuo, 4,482,234, Cl. 354-402.000.
Yasukawa, Seiichi; Terui, Nobuhiko; and Fukuhara, Toru, 4,482,235, Cl. 354-402.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Kanayama, Hisayasu; Sasaki, Yoshiaki; Furuno, Naoki; Sasaoka, Yoshitaka; and Tokita, Osamu, 4,482,382, Cl. 106-90.000.
Nippon Oil Company, Ltd.: *See*—
Ushio, Masaru; Morita, Toru; Ishii, Takeshi; and Oishi, Yasuyuki, 4,482,450, Cl. 208-152.000.
Nippon Oil and Fats Company, Limited: *See*—
Takeuchi, Fumio; Takahashi, Masao; and Sakai, Hiroshi, 4,482,403, Cl. 149-2.000.
Nippon Paint Co., Ltd.: *See*—
Yamamori, Naoki; Yokoi, Junji; and Yoshikawa, Motoyoshi, 4,482,701, Cl. 528-295.500.
Nippon Soda Company Limited: *See*—
Iwataki, Isao; Nakayama, Akira; Kaeriyama, Minoru; Ishikawa, Hisao; Hosaka, Hideo; Kohara, Kenichi; and Yamada, Shozo, 4,482,740, Cl. 564-99.000.
Nippon Steel Corporation: *See*—
Nakano, Taketo; Fuji, Masao; and Mizoguchi, Shozo, 4,482,003, Cl. 164-452.000.
Taketomo, Eiiji; and Fujiura, Masami, 4,482,360, Cl. 55-16.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Houkawa, Kouji; Ishida, Akira; and Okada, Masaru, 4,482,821, Cl. 307-462.000.
Nippondenso Co., Ltd.: *See*—
Hori, Shinichi; Ohnishi, Yasuichi; Ono, Makoto; Ueda, Masahiro; and Noba, Masahiko, 4,482,812, Cl. 290-38.00R.
Nishimura, Masao; Mori, Masami; and Kai, Yasuhito, 4,482,009, Cl. 165-41.000.
Tsuda, Tadashi; Hiramatsu, Seiichiro; Maeno, Tsuyoshi; and Ohtsuka, Mitsugi, 4,482,889, Cl. 340-514.000.
Tsukahara, Kenji; Mutsukura, Kouji; and Inoue, Takayoshi, 4,481,921, Cl. 123-304.000.
Yoshimi, Akiro; Takagi, Masashi; Sakurai, Masao; and Takemi, Akio, 4,482,007, Cl. 165-21.000.
Nishihara, Eitaro: *See*—
Nakayama, Nobutoshi; Ito, Yukinobu; Nishihara, Eitaro; Iwata, Kazuhide; and Shibayama, Shigeki, 4,482,958, Cl. 364-414.000.
Nishijima, Hideo; Fukushima, Isao; and Hibi, Masao, to Hitachi, Ltd. Method and apparatus for magnetic recording and reproducing. 4,482,926, Cl. 360-14.200.
Nishikawa, Kazuyuki; Hirao, Katsumi; Mizuguchi, Kazuhiko; and Suzuki, Hiroshi, to Daicel Chemical Industries, Ltd.; and Shinto Kogio Ltd. Binder coated foundry sand grains. 4,482,654, Cl. 523-145.000.
Nishikawa, Mikio; Fujii, Hiroyuki; Tateno, Kenichi; and Yokozawa, Masami, to Matsushita Electronics Corp. Lead frame for plastic encapsulated semiconductor device. 4,482,915, Cl. 357-72.000.
Nishimura, Masao; Mori, Masami; and Kai, Yasuhito, to Nippondenso Co., Ltd. Automobile air conditioning system. 4,482,009, Cl. 165-41.000.
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shunichi; and Tezuka, Yasuo, to Sumitomo Chemical Company, Limited. Process for producing aminoaryl-β-sulfatoethylsulfone. 4,482,501, Cl. 260-458.00C.
Nishiyama, Kazuo; Yanada, Tetsunosuke; and Arai, Michio, to Sony Corporation. Method of activating implanted ions by incoherent light beam. 4,482,393, Cl. 148-1.500.
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Zaidan Hojin Handotai Kenkyu Shinkokai. Heterojunction emitter transistor with saturation drift velocity gradient in base. 4,482,910, Cl. 357-34.000.
Nissan Motor Company, Limited: *See*—
Ishida, Takashi; and Hamada, Kazutaka, 4,482,135, Cl. 267-8.00R.
Mochida, Haruo, 4,482,885, Cl. 340-52.00R.
Nagashima, Hideyuki; and Okuyama, Hiroo, 4,482,187, Cl. 297-468.000.
Ogasawara, Takashi; Hasebe, Tetsuzi; and Koriyama, Masayuki, 4,481,982, Cl. 139-435.000.
Niwa, Toshio: *See*—
Imahori, Seiichi; Niwa, Toshio; Okada, Itaru; and Sato, Kuninori, 4,482,490, Cl. 534-797.000.
Noba, Masahiko: *See*—
Hori, Shinichi; Ohnishi, Yasuichi; Ono, Makoto; Ueda, Masahiro; and Noba, Masahiko, 4,482,812, Cl. 290-38.00R.
Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,482,105, Cl. 242-212.000.

Noda, Toyokazu; and Ohki, Hiroshi, to Sony Corporation. Objective lens mount for optical disc player. 4,482,986, Cl. 369-44.000.
Nokami, Junzo: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; Shirai, Takashi; and Tanaka, Akira. 4,482,491, Cl. 260-245.400.
Nomaguchi, Tamotsu; and Sakai, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Air conditioner operable in a room cooling mode and a room warming mode using either outdoor air or a separate heat source as a source of heat. 4,482,008, Cl. 165-29.000.
Nomura, Masami: *See*—
Yoshida, Masayuki; Nomura, Masami; and Ikejima, Hiroyuki. 4,482,031, Cl. 187-29.00R.
Noranda Inc.: *See*—
Bowen, Christopher T.; Davis, H. John; and LeRoy, Rodney L., 4,482,448, Cl. 204-284.000.
Norba Aktiebolag: *See*—
Froderberg, Kenneth. 4,482,283, Cl. 414-492.000.
Norden, Alexander R. Electrical apparatus with plug-in modules. 4,482,938, Cl. 361-426.000.
Norlin Industries, Inc.: *See*—
Swain, Richard S.; and Fimoff, Mark. 4,481,851, Cl. 84-1.010.
Norman, Edward C., to Foamink Company, Inc. Foamed ink composition and method of making the same. 4,482,648, Cl. 521-65.000.
North American Philips Consumer Electronics Corp.: *See*—
Collins, Floyd K.; and Say, Donald L., 4,482,840, Cl. 313-446.000.
North, William E.; and Szewczuk, Thomas M., to Westinghouse Electric Corp. Turbine airfoil vane structure. 4,482,295, Cl. 416-96.00A.
Northern Petrochemical Company: *See*—
Fries, Richard W., 4,482,638, Cl. 502-108.000.
Norton Christensen, Inc.: *See*—
Fulkerson, Larry R., 4,482,013, Cl. 166-118.000.
Norton, Edward W., to Schlegel Corporation. Seal means for sealing a panel movable through and from a slot. 4,481,736, Cl. 49-373.000.
Norton, Gary L.: *See*—
Robbins, Bobbie L.; and Norton, Gary L., 4,482,284, Cl. 414-539.000.
Noshay, Allen; Karol, Frederick J.; and Jorgensen, Robert J., to Union Carbide Corporation. Preparation of low-density ethylene copolymers in fluid bed reactor. 4,482,687, Cl. 526-125.000.
Notaras, Angelo L.: *See*—
Notaras, John A.; and Notaras, Angelo L., 4,482,831, Cl. 310-156.000.
Notaras, John A.; and Notaras, Angelo L. Magneto arrangement. 4,482,831, Cl. 310-156.000.
Nouvertne, Werner: *See*—
Neuray, Dieter; Nouvertne, Werner; Binsack, Rudolf; Rempel, Dieter; and Muller, Peter R., 4,482,672, Cl. 525-67.000.
Nozaki, Shigeki; Takemae, Yoshihiro; Kabashima, Katsuhiko; and Enomoto, Seiji, to Fujitsu Limited. Semiconductor device having a circuit for generating a voltage higher than a supply voltage and responsive to variations in the supply voltage. 4,482,825, Cl. 307-578.000.
NSK-Warner K.K.: *See*—
Sano, Yasumasa, 4,482,102, Cl. 242-107.200.
Sano, Yasumasa; and Kawai, Osamu, 4,482,103, Cl. 242-107.200.
Nyhus, Orville K., to Rockwell International Corporation. Printed hybrid quadrature 3 dB signal coupler apparatus. 4,482,873, Cl. 333-116.000.
Oates, Robert M.: *See*—
Peterson, Charles A.; Grove, Louis C., Jr.; Miller, Robert C.; and Oates, Robert M., 4,482,930, Cl. 361-16.000.
Obara, Sanshiro: *See*—
Yoneyama, Takao; Satoh, Ichiya; Obara, Sanshiro; Inoue, Tomoaki; and Koga, Tsuguaki, 4,481,819, Cl. 73-593.000.
Obara, Toshio: *See*—
Kaneko, Kazuo; Obara, Toshio; Gonda, Michihiro; Kickawa, Katsumasa; and Kanasugi, Mikiko, 4,482,905, Cl. 346-207.000.
Oberleitner, Gerhard, to TMC Corporation. Safety ski binding. 4,482,168, Cl. 280-612.000.
Obermeyer, James H.: *See*—
Siska, Thomas J.; and Obermeyer, James H., 4,482,042, Cl. 193-35.00A.
Oberstrass, Detley, to Barmag Barmer Maschinenfabrik AG. Control for yarn false twisting apparatus. 4,481,762, Cl. 57-80.000.
Oblack, Steven M.: *See*—
Wood, Thomas G.; and Oblack, Steven M., 4,482,387, Cl. 106-270.000.
O'Brien Goins Engineering, Inc.: *See*—
O'Brien, Thomas B.; and Thomas, Edwin W., 4,481,973, Cl. 137-469.000.
O'Brien, Thomas B.; and Thomas, Edwin W., to O'Brien Goins Engineering, Inc. Differential pressure energized circulating valve. 4,481,973, Cl. 137-469.000.
O'Brien, William F., to Ketcham & McDougall, Inc. Adjustable wind direction devices. 4,481,810, Cl. 73-178.00R.
Occidental Chemical Corporation: *See*—
Ranade, Gautam R., 4,482,732, Cl. 560-86.000.
Ranade, Gautam R., 4,482,733, Cl. 560-86.000.
Odermann, Charles R.; and Larsen, Robert H., to Singer Company, The. Clutching arrangement for a sewing machine bobbin. 4,481,897, Cl. 112-279.000.
Ogasawara, Takashi; Hasebe, Tetsuzi; and Koriyama, Masayuki, to Nissan Motor Company, Limited. Weft pull-back device of a jet weaving loom. 4,481,982, Cl. 139-435.000.
Ogawa, Hiroshi: *See*—
Takigawa, Hiroyoshi; and Ogawa, Hiroshi, 4,481,992, Cl. 152-209.00R.
Ogawa, Masaki; Hirata, Yasushi; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, to Bridgestone Tire Co., Ltd. Pneumatic radial tires. 4,481,995, Cl. 152-356.00R.
Ogawa, Riichi: *See*—
Saito, Tadao; and Ogawa, Riichi, 4,482,067, Cl. 215-12.00R.
Ogawa, Yoh: *See*—
Inaba, Humio; Ito, Hiromasa; and Ogawa, Yoh, 4,483,004, Cl. 372-8.000.
Oguri, Masao: *See*—
Shimizu, Keizo; Takeda, Katunobu; Furuichi, Tokinori; Oguri, Masao; and Ikoma, Junichi, 4,482,992, Cl. 369-221.000.
O'Handley, Robert C., to Allied Corporation. Low magnetostriction amorphous metal alloys. 4,482,400, Cl. 148-31.550.
Ohba, Takeo: *See*—
Moriya, Ryusuke; Eguchi, Takeo; and Ohba, Takeo, 4,482,928, Cl. 360-77.000.
Ohki, Hiroshi: *See*—
Noda, Toyokazu; and Ohki, Hiroshi, 4,482,986, Cl. 369-44.000.
Ohmi, Tadahiro: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,482,910, Cl. 357-34.000.
Ohnishi, Sumio, to Toyo Tire & Rubber Co., Ltd. Pneumatic tires. 4,481,993, Cl. 152-209.00B.
Ohnishi, Yasuichi: *See*—
Hori, Shinichi; Ohnishi, Yasuichi; Ono, Makoto; Ueda, Masahiro; and Noba, Masahiko, 4,482,812, Cl. 290-38.00R.
Ohno, Satoru: *See*—
Uda, Masahiro; Ohno, Satoru; and Hoshi, Tutomu, 4,482,134, Cl. 266-217.000.
Ohodaira, Takeo; and Mizutani, Takashi, to Toppan Printing Co., Ltd. Container resistant to extremely low temperatures. 4,482,585, Cl. 428-35.000.
Ohshima, Nobumasa: *See*—
Habata, Etsuroh; Ohshima, Nobumasa; and Kanatani, Kenji, 4,482,801, Cl. 219-540.000.
Ohta, Norio: *See*—
Suzuki, Ikuo; Unno, Kunihiko; and Ohta, Norio, 4,481,739, Cl. 51-5.00D.
Ohta, Yoshihiro; Kawakami, Hidenori; and Tsuruta, Keiji, to Mitsubishi Denki Kabushiki Kaisha. Iron core for three-phase electromagnetic induction machine. 4,482,880, Cl. 336-217.000.
Ohtake, Yasuhisa; Seino, Kazuyuki; and Kamohara, Eiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for making CRT shadow masks. 4,482,334, Cl. 445-47.000.
Ohtsuka, Mitsugi: *See*—
Tsuda, Tadashi; Hiramatsu, Seiichiro; Maeno, Tsuyoshi; and Ohtsuka, Mitsugi, 4,482,889, Cl. 340-514.000.
Ohyama, Yasuyoshi: *See*—
Aizawa, Kuniomi; Ohyama, Yasuyoshi; Okuma, Yasuo; Okano, Yoshio; and Kitamura, Youichirou, 4,482,802, Cl. 235-379.000.
Oishi, Yasuyuki: *See*—
Ushio, Masaru; Morita, Toru; Ishii, Takeshi; and Oishi, Yasuyuki, 4,482,450, Cl. 208-152.000.
Okabe, Nobuo: *See*—
Takagi, Tadao; and Okabe, Nobuo, 4,482,234, Cl. 354-402.000.
Okada, Hiroji: *See*—
Shiramizu, Kousuke; Awano, Yoshiro; Takeyama, Hiroyuki; Sakakibara, Kenji; Okada, Hiroji; and Yamagami, Hiromu, 4,482,797, Cl. 219-137.610.
Okada, Itaru: *See*—
Imahori, Seiichi; Niwa, Toshio; Okada, Itaru; and Sato, Kuninori, 4,482,490, Cl. 534-797.000.
Okada, Kazuo; and Imado, Fumiaki, to Mitsubishi Denki Kabushiki Kaisha. Optical information reproducing apparatus. 4,482,987, Cl. 369-44.000.
Okada, Masaru: *See*—
Houkawa, Kouji; Ishida, Akira; and Okada, Masaru, 4,482,821, Cl. 307-462.000.
Okamoto, Yasushi: *See*—
Furukawa, Hiroshi; Saito, Yuichi; Imai, Akio; Yoshida, Nobuyuki; and Okamoto, Yasushi, 4,482,678, Cl. 525-236.000.
Okano, Tadao, to TDK Electronics Co., Ltd. Hot melt screen printing machine. 4,481,881, Cl. 101-126.000.
Okano, Yoshio: *See*—
Aizawa, Kuniomi; Ohyama, Yasuyoshi; Okuma, Yasuo; Okano, Yoshio; and Kitamura, Youichirou, 4,482,802, Cl. 235-379.000.
OKI Electric Industry Co. Ltd.: *See*—
Sagara, Iwao; and Kataoka, Keisuke, 4,482,787, Cl. 179-90.00D.
Okita, Tsutomu; and Naruo, Kyoichi, to Fuji Photo Film Co., Ltd. Magnetic recording medium and process for producing the same. 4,482,610, Cl. 428-483.000.
Okita, Tsutomu: *See*—
Akashi, Goro; Kitamoto, Tatsuji; and Okita, Tsutomu, 4,482,578, Cl. 427-44.000.
Okuma, Yasuo: *See*—
Aizawa, Kuniomi; Ohyama, Yasuyoshi; Okuma, Yasuo; Okano, Yoshio; and Kitamura, Youichirou, 4,482,802, Cl. 235-379.000.
Okumura, Takeshi: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,915, Cl. 123-188.00M.
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,916, Cl. 123-188.00M.

Okuyama, Hiroo: *See*—
Nagashima, Hideyuki; and Okuyama, Hiroo, 4,482,187, Cl. 297-468.000.
Okuzawa, Tugio: *See*—
Hibi, Kunio; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,482,147, Cl. 271-229.000.
Olds, Dale F., to Frito-Lay, Inc. Aerated oil-based cheese mixture. 4,482,575, Cl. 426-582.000.
Olin Corporation: *See*—
Huang, Tai-Nang; and Fernandez, Carlos G., 4,482,753, Cl. 568-678.000.
Kadija, Igor V., 4,482,440, Cl. 204-105.00R.
Rothgery, Eugene F., 4,482,738, Cl. 564-37.000.
Trotz, Samuel I.; and Farmer, Douglas A., Jr., 4,482,715, Cl. 546-6.000.
Olschewski, Armin: *See*—
Walter, Lothar; Brandentein, Manfred; Ernst, Horst M.; and Olschewski, Armin, 4,482,338, Cl. 464-167.000.
Olsen, Olav: *See*—
Einstabland, Tomas B.; and Olsen, Olav, 4,481,899, Cl. 114-264.000.
Olson, Scott M. Doubles target trap. 4,481,932, Cl. 124-8.000.
Olympus Optical Co., Ltd.: *See*—
Ishiwatari, Shiro, 4,482,071, Cl. 215-255.000.
Kidawara, Atsushi; and Kobayashi, Kazunari, 4,482,050, Cl. 206-389.000.
Matsui, Kohichi; and Tanikawa, Kowji, 4,482,894, Cl. 340-756.000.
Omega, S.A.: *See*—
Gygax, Claude-Andre ; Jaccard, Pierre-Ernest; and Jaunin, Jean-Pierre, 4,482,255, Cl. 368-10.000.
Onaka, Hidemi; and Yoshioka, Mamoru, to Toyota Jidosha Kobushiki Kaisha. Altitude compensation device for internal combustion engine. 4,482,508, Cl. 261-39.00A.
Ondetti, Miguel A.; and Ryono, Denis E., to E. R. Squibb & Sons, Inc. S-Acylation products of mercaptoacyl amino acids and carboxyl group containing diuretics. 4,482,725, Cl. 548-533.000.
O'Neal, James E.: *See*—
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,482,375, Cl. 75-0.50C.
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Diphenylalkanoether and diphenylalkanone oximeether derivatives. 4,482,573, Cl. 424-327.000.
Ono, Makoto: *See*—
Hori, Shinichi; Ohnishi, Yasuichi; Ono, Makoto; Ueda, Masahiro; and Noba, Masahiko, 4,482,812, Cl. 290-38.00R.
Onuki, Jin: *See*—
Chiba, Akio; Shimizu, Seiki; Kuniya, Keiichi; and Onuki, Jin, 4,482,912, Cl. 357-67.000.
Oproiu, Margareta: *See*—
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, 4,482,376, Cl. 75-10.00R.
Orain, Michel A., to Glaenzer Spicer. Homokinetic tripod joint and the application of the joint in a wheel hub structure. 4,482,336, Cl. 464-111.000.
Orengo, Gerard, to International Business Machines Corporation. Floating back-up power supply. 4,482,815, Cl. 307-44.000.
Oritani, Atsushi, to Fujitsu Limited. Static type semiconductor memory device. 4,482,984, Cl. 365-154.000.
Oritsuki, Ryoji; Ichimura, Yukio; Kanai, Hiromi; and Shimada, Kenichi, to Hitachi, Ltd. Photosensor array wherein each photosensor comprises a plurality of amorphous silicon p-i-n diodes. 4,482,804, Cl. 250-211.00J.
Orphanides, Gus G., to Air Products and Chemicals, Inc. Process for the production of polyurethane urea elastomers. 4,482,690, Cl. 528-64.000.
Orsino, Joseph A.; Sawyer, Ernest R.; and Hollett, Ronald J., to Concorde Battery Corporation. Aircraft battery. 4,482,618, Cl. 429-179.000.
Orszagos Koolaj es Gazipari Troszt: *See*—
Natkai, Lajos; and Ujfelusi, Elek, 4,482,305, Cl. 418-48.000.
Ortho Pharmaceutical Corporation: *See*—
Hajos, Zoltan G.; and Wachter, Michael P., 4,482,730, Cl. 549-448.000.
Ortwerth, Paul J.; and Lampson, Alan I., to United States of America, Air Force. Axial flow laser cavity. 4,483,006, Cl. 372-58.000.
Osaka Transformer Co., Ltd.: *See*—
Shiramizu, Kousuke; Awano, Yoshiro; Takeyama, Hiroyuki; Sakakibara, Kenji; Okada, Hiroji; and Yamagami, Hiromu, 4,482,797, Cl. 219-137.610.
Osaki, Humio: *See*—
Suzuki, Naoyoshi; Hirose, Tsuneo; and Osaki, Humio, 4,482,543, Cl. 424-177.000.
Osborn, Donald H.; and Basley, Richard J., to MPD Technology Corporation. Production of electrically conductive metal flake. 4,482,374, Cl. 75-0.50R.
Ose, Earl E.: *See*—
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., 4,482,488, Cl. 260-112.50R.
Osgood, Gordon L.; and Reinhard, George G., to Fuel-X-Tender Corporation. Fuel additive. 4,482,352, Cl. 44-53.000.
Oshiro, Yasuo: *See*—
Banno, Kazuo; Fujioka, Takafumi; Oshiro, Yasuo; and Nakagawa, Kazuyuki, 4,482,560, Cl. 424-258.000.
Oskar Dilo Maschinenfabrik KG: *See*—
Dilo, Johann P., 4,481,694, Cl. 19-296.000.
Ostermayer, Frederick W., Jr.: *See*—
Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,482,442, Cl. 204-129.300.
Oswald, Heinz; and Vetterli, Walter, to Rieter Machine Works Ltd. Thread catcher ring. 4,482,099, Cl. 242-19.000.
Otani, Koichi: *See*—
Hirai, Kentaro; Ishiba, Teruyuki; Matsutani, Shigeru; Makino, Itsuo; Fujishita, Toshio; Doeteuchi, Masami; and Otani, Koichi, 4,482,566, Cl. 424-274.000.
Otsu, Hiroshi: *See*—
Tanei, Hirayoshi; Iwanaga, Shoichi; Ikegami, Akira; Otsu, Hiroshi; and Isonae, Hiromi, 4,481,813, Cl. 73-336.500.
Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Torii, Sigeru; Tanaka, Hideo; and Shiroi, Takashi, 4,482,435, Cl. 209-73.00R.
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; Shiroi, Takashi; and Tanaka, Akira, 4,482,491, Cl. 260-245.400.
Otsuka, Kenichi; and Shimamura, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Current control apparatus for electric power systems. 4,482,855, Cl. 318-809.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Banno, Kazuo; Fujioka, Takafumi; Oshiro, Yasuo; and Nakagawa, Kazuyuki, 4,482,560, Cl. 424-258.000.
Otsuka Pharmaceutical Factory, Inc.: *See*—
Suzuki, Naoyoshi; Hirose, Tsuneo; and Osaki, Humio, 4,482,543, Cl. 424-177.000.
Ouellette, Paul J.; and Riviezzo, Vincent F., to AT&T Technologies, Inc. Low-insertion force solder-bearing lead. 4,482,197, Cl. 339-17.00C.
Over-Lowe Company: *See*—
Ziernicki, Richard, 4,482,125, Cl. 248-604.000.
Overton, Kenneth J. Tactile sensor. 4,481,815, Cl. 73-432.00R.
Owens-Corning Fiberglas Corporation: *See*—
Dewey, Keith L.; and Varrasso, Eugene C., 4,482,261, Cl. 374-181.000.
Eisenberg, Arnold J., 4,482,370, Cl. 65-1.000.
Varrasso, Eugene C., 4,483,008, Cl. 373-27.000.
Owens-Illinois, Inc.: *See*—
Brady, Thomas E., Jr., 4,482,518, Cl. 264-535.000.
OY. Tampella AB: *See*—
Majaniemi, Pekka, 4,482,430, Cl. 162-358.000.
Oya, Masayuki: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,482,709, Cl. 536-46.000.
Oza, Bharat J.; and Roche, Thomas J., to International Business Machines Corporation. Data processor system clock checking system. 4,482,819, Cl. 307-269.000.
Ozaki, Syunzaburo, to Honda Giken Kogyo Kabushiki Kaisha. Throttle valve control apparatus in internal combustion engine. 4,481,923, Cl. 123-320.000.
Ozaki, Toshio: *See*—
Kitazawa, Kohji; and Ozaki, Toshio, 4,482,351, Cl. 44-1.00R.
Ozawa, Minoru: *See*—
Sonoda, Masakazu; Terajima, Takashi; and Ozawa, Minoru, 4,482,850, Cl. 318-606.000.
Ozen Corporation: *See*—
Koike, Eishi, 4,482,990, Cl. 369-63.000.
Pachel, Max; and Schneider, Norbert, to U.S. Philips Corporation. Dry-shaving apparatus and head-member unit for said apparatus. 4,481,711, Cl. 30-34.100.
Paduchowski, James S.: *See*—
Hindman, David B.; Wood, Norman E.; Foster, David N.; Damtoft, D. Stephans, Jr.; and Paduchowski, James S., 4,482,461, Cl. 210-741.000.
Paetsch, Juergen: *See*—
Herrmann, Guenter; Frommer, Elmar; Paetsch, Juergen; Reiss, Wolfgang; and Winderl, Siegfried, 4,482,764, Cl. 568-864.000.
Pais, Istvan; Feher nee Ravasz, Magda; Nagy, Balint; Bokori, Jozsef; and Szabo, Zoltan. Fodder and fodder additives promoting the weight increase of domestic animals and a process for the use thereof. 4,482,550, Cl. 424-245.000.
Palamara, Joseph P. Foldable toothbrush and toothpaste supply unit. 4,482,263, Cl. 401-191.000.
Palgrave, Derek A.; Waite, Frederick A.; Birchall, James D.; Cooper, John; and Enever, James A., to Imperial Chemical Industries PLC. Fluid fertilizer composition. 4,482,372, Cl. 71-35.000.
Pall Corporation: *See*—
Roach, Charles J., 4,482,365, Cl. 55-218.000.
Palma, Jean-Pierre: *See*—
Eberhard, Patrick; Mindt, Wolfgang; Palma, Jean-Pierre; Schafer, Robert; and Scharf, Robert, 4,481,804, Cl. 73-1.00G.
Palmer, John P., to General Dynamics, Pomona Division. Fiber optic matrix multiplier. 4,482,805, Cl. 250-227.000.
Panduit Corp.: *See*—
Caveney, Jack E.; Moody, Roy A.; and Bulanda, John J., 4,481,710, Cl. 29-749.000.
Papst-Motoren GmBH & Co., K.G.: *See*—
Doemen, Benno; and Muller, Rolf, 4,482,849, Cl. 318-254.000.
Papuchon, Michel; Puech, Claude; and Arditty, Herve , to Thomson-CSF. Interferometer with a tunable optical resonator incorporating a monomode optical fibre and application to filtering and spectography. 4,482,248, Cl. 356-346.000.
Paredes, Jose R. Vertical lifting and placing apparatus. 4,482,130, Cl. 254-8.00R.

Parent, Edward D.: *See*—
Pricenski, Theodore J.; and Parent, Edward D., 4,482,799, Cl. 219-275.000.
Park-Ohio Industries, Inc.: *See*—
Jackowicz, Stanley E., 4,482,879, Cl. 336-55.000.
Lewis, John C., 4,482,793, Cl. 219-10.710.
Park, Owen H., to Heartland Industries, Inc. Building structure. 4,481,744, Cl. 52-92.000.
Parlman, Robert M.: *See*—
Bresson, Clarence R.; Parlman, Robert M.; and Robles, Benjamin R., 4,482,480, Cl. 252-61.000.
Passarotti, Carlo: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,482,555, Cl. 424-248.400.
Passerell, Carl E.: *See*—
Jacobson, Irvin D.; Volgstadt, Frank R.; and Passerell, Carl E., 4,482,170, Cl. 285-55.000.
Patch, Stanley J., to United States of America, Navy. Matrix band inset. 4,482,319, Cl. 433-39.000.
Patton, John T., Jr.: *See*—
Reichel, Curtis J.; Patton, John T., Jr.; and Narayan, Thirumurti, 4,482,651, Cl. 521-115.000.
Pavlin, Mark S., to Union Camp Corporation. Preparation of hydroxycitronellol. 4,482,765, Cl. 568-875.000.
Pawelec, Jerzy. Device for the study of the alimentary canal. 4,481,952, Cl. 128-769.000.
Pawlak, Donald A.: *See*—
Baker, Ray W.; Pawlak, Donald A.; and Ramey, Alford J., 4,482,129, Cl. 251-334.000.
Pawlowski, Thomas D.; and Vaxmonsky, Joseph J., to James River-Dixie/Northern, Inc. Cup dispenser. 4,482,080, Cl. 221-310.000.
PDT Development & Marketing: *See*—
Carr, William J.; and Carr, Wallace B., 4,481,920, Cl. 123-246.000.
Pecz, Peter; and Hivesay, Geza, to Energiagazdalkodasi Intezet. Hybrid heat pump. 4,481,783, Cl. 62-101.000.
Peczkowski, Jurgen: *See*—
Knapp, Heinrich; Sauer, Rudolf; Hans, Waldemar; Linssen, Mathias; Peczkowski, Jurgen; and Krauss, Rudolf, 4,481,699, Cl. 29-157.10R.
Peet, William G.: *See*—
Herskovitz, Thomas; and Peet, William G., 4,482,635, Cl. 436-134.000.
Pellet, Regis J.: *See*—
Sorrentino, Cecelia M.; Pellet, Regis J.; and Bertolacini, Ralph J., 4,482,449, Cl. 208-139.000.
Pellicelli, Bruno, to Bayer Aktiengesellschaft. Dielectrically heatable polyolefin foams containing unsaturated polyester. 4,482,602, Cl. 428-245.000.
Peng, Tzy C.: *See*—
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,482,375, Cl. 75-0.50C.
Pensa, Inc.: *See*—
Stubblefield, Jerry D., 4,481,727, Cl. 36-83.000.
Penz, Perry A.: *See*—
Piliavin, Michael A.; Sampsell, Jeffrey B.; and Penz, Perry A., 4,482,213, Cl. 350-334.000.
Perfection Corporation: *See*—
Jacobson, Irvin D.; Volgstadt, Frank R.; and Passerell, Carl E., 4,482,170, Cl. 285-55.000.
Perkin-Elmer Corporation, The: *See*—
Blazek, Henry, 4,482,971, Cl. 364-552.000.
Perring, Dudley, to Thorn EMI-Varian Limited. Gyrotron device. 4,482,843, Cl. 315-4.000.
Perry, Derick A., to Rolls-Royce Limited. Casing support for a gas turbine engine. 4,482,293, Cl. 415-219.00R.
Perry, Philip M.: *See*—
Bailey, David C.; Burberry, Lee M.; Trimble, Donald E.; Bardos, Andrew M.; and Perry, Philip M., 4,482,902, Cl. 346-108.000.
Perugi, Archie H.: *See*—
Hsieh, Benjamin C. B.; and Perugi, Archie H., 4,482,358, Cl. 48-77.000.
Peruzzi, Armando, to Selenia Industrie Elettroniche Associate S.p.A. Hydraulic jack with mechanical safety lock. 4,481,864, Cl. 91-44.000.
Pessimisis, George N.: *See*—
Jennings, James R.; and Pessimisis, George N., 4,482,645, Cl. 502-316.000.
Pesta, Richard K. Portable toiletry stand. 4,481,962, Cl. 132-79.00R.
Peters, Edwin L., to Reichhold Chemicals, Inc. Tree stump extractor. 4,481,989, Cl. 144-335.000.
Peterseil, Hartger. Polarized electromagnetic midget relay. 4,482,875, Cl. 335-81.000.
Petersen, Carl M., III: *See*—
Gavagan, James A.; Petersen, Carl M., III; and Ray, Michael J., 4,482,137, Cl. 267-157.000.
Peterson, Charles A.; Grove, Louis C., Jr.; Miller, Robert C.; and Oates, Robert M., to Westinghouse Electric Corp. Electrical protection equipment with digital integration apparatus for firing pulse initiation. 4,482,930, Cl. 361-16.000.
Peterson, Jeffrey J.: *See*—
Lueptow, Richard M.; and Peterson, Jeffrey J., 4,482,342, Cl. 494-21.000.
Peterson, Robert B., to M. W. Kellogg Company, The. Ammonia synthesis converter. 4,482,523, Cl. 422-148.000.
Petrini, Valentino; and Preda, Stefano, to Carbochimica Italiana S.p.A. Method and equipment for producing solid granules of pitch in the form of cylinders crushed at the ends. 4,482,517, Cl. 264-143.000.
Petrovic, Vladan; and Durselen, Heinz, to Krupp-Koppers GmbH. Device for drying and preheating coking coal. 4,481,724, Cl. 34-168.000.
Petrzelka, Miloslav, to Uni-Cardan Aktiengesellschaft. Universal joint. 4,482,337, Cl. 464-128.000.
Pettingell, Winslow L.; and Hall, John F., to Foam Cutting Engineers, Inc. Cleaning method and apparatus for parabolic cellular louvers for lighting fixtures. 4,482,391, Cl. 134-6.000.
Pfizer Inc.: *See*—
Reiter, Lawrence A., 4,482,723, Cl. 548-343.000.
Richardson, Kenneth; and Whittle, Peter J., 4,482,558, Cl. 424-251.000.
Pharmacia, Inc.: *See*—
Haff, Lawrence A.; and Ewell, Anthony J., 4,482,482, Cl. 260-112.00R.
Pharmindustrie: *See*—
Renault, Christian, 4,482,711, Cl. 544-42.000.
Phelps, Paul S., to Star Sales Company, Inc. Knife for releasible attachment to a base. 4,481,712, Cl. 30-151.000.
Philip Morris Incorporated: *See*—
Chan, Woontung G., 4,481,956, Cl. 131-276.000.
Rainer, Norman B.; and Keritsis, Gus D., 4,481,958, Cl. 131-331.000.
Williams, David L.; Southwick, Everett W.; and Houminer, Yoram, 4,481,957, Cl. 131-278.000.
Philipp, Bernhard: *See*—
Feldkamper, Richard; and Philipp, Bernhard, 4,482,145, Cl. 271-95.000.
Phillips, Edward H., to American Fitness, Inc. Shoe construction. 4,481,726, Cl. 36-30.00A.
Phillips Petroleum Company: *See*—
Bresson, Clarence R.; Parlman, Robert M.; and Robles, Benjamin R., 4,482,480, Cl. 252-61.000.
Cheng, Paul J., 4,481,828, Cl. 73-861.630.
Coombs, Daniel M.; and Willers, Gary P., 4,482,453, Cl. 208-309.000.
Dix, James S., 4,482,665, Cl. 524-262.000.
Drake, Charles A., 4,482,433, Cl. 203-59.000.
Drake, Charles A., 4,482,757, Cl. 568-798.000.
Eastman, Alan D.; and Kimble, James B., 4,482,646, Cl. 502-324.000.
Funk, Gary L.; and Feldman, James A., 4,482,969, Cl. 364-500.000.
Gray, Roy A., 4,482,465, Cl. 252-67.000.
Knudsen, Ronald D.; and Reiter, Stephen E., 4,482,640, Cl. 502-155.000.
Kraus, Gerard, 4,482,663, Cl. 524-99.000.
Leland, John E.; and Boeke, Paul J., 4,482,668, Cl. 524-413.000.
Voss, Raymond G., 4,482,045, Cl. 198-670.000.
Phoenix Foam Inc.: *See*—
Miutel, Alexander; and Shira, Jerry P., 4,482,649, Cl. 521-86.000.
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; Menconi, Augusto; and Logoni, Angelo, to Montedison, S.p.A. Pyrethroids. 4,482,570, Cl. 424-304.000.
Pieper, Henner, to Continental Gummi-Werke Aktiengesellschaft. Tread configuration for motor vehicle tires. 4,481,991, Cl. 152-209.00R.
Piher Sociedad Anonima: *See*—
Heredero, Juan L., 4,482,883, Cl. 338-163.000.
Piliavin, Michael A.; Sampsell, Jeffrey B.; and Penz, Perry A., to Texas Instruments Incorporated. Perimeter seal reinforcement holes for plastic LCDs. 4,482,213, Cl. 350-334.000.
Pioch, Lothar: *See*—
Reuter, Herbert; Pioch, Lothar; Schmid, Karl-Heinz; and Seiter, Wolfgang, 4,482,470, Cl. 252-162.000.
Pioneer Electronic Corporation: *See*—
Hirata, Hitoshi, 4,482,869, Cl. 331-4.000.
Plapp, Bryce V.; and Chadha, Vijay K., to University of Iowa Research Foundation. Inhibition of alcohol metabolism by tetramethylene sulfoxides. 4,482,568, Cl. 424-275.000.
Plasti-Kote Company, Inc.: *See*—
Rapaport, Stanley; and Cachat, Francis J., 4,482,662, Cl. 523-504.000.
Plastic Oddities, Inc.: *See*—
Izzi, Lewis B., Sr., 4,482,161, Cl. 277-207.00A.
Platz, Rolf: *See*—
Merger, Franz; Nestler, Gerhard; Platz, Rolf; Towae, Friedrich; and Hellbach, Hans, 4,482,499, Cl. 260-453.00P.
Pletsch, Hubert: *See*—
Wolf, Franz-Josef; Pletsch, Hubert; and Benneyan, Gregoire, 4,482,136, Cl. 267-152.000.
Plichta, Bohumil M. J., to AECI Limited. Apparatus for and a method of testing detonating systems. 4,482,858, Cl. 324-57.00Q.
Pliefke, Engelbert, to Hoechst Aktiengesellschaft. Process for electrochemically roughening aluminum for printing plate supports. 4,482,434, Cl. 204-33.000.
Plotze, Bodo. Cleaning agent for fire-arm barrels. 4,482,469, Cl. 252-155.000.
Podell, Howard I.: *See*—
Goldstein, Albert; and Podell, Howard I., 4,482,577, Cl. 427-2.000.
Poeppelmeier, Kenneth R.: *See*—
Beyerlein, Robert A.; Jacobson, Allan J.; and Poeppelmeier, Kenneth R., 4,482,644, Cl. 502-303.000.
Pohle, Richard H., to Lockheed Missiles & Space Co., Inc. Lateral transfer system for an optical beam. 4,482,208, Cl. 350-286.000.

Polaroid Corporation: *See*—
Alston, Lawrence E.; and Haroutunian, David S., 4,482,919, Cl. 358-152.000.

Pollock, Charles B.; Murzyn, Patrick J.; Brennom, Stephen O.; and Lambert, James N., to Union Carbide Corporation. Conduit cleaning process. 4,482,392, Cl. 134-7.000.

Polysar Limited: *See*—
Fischer, Erhardt; and Edwards, Douglas C., 4,482,657, Cl. 523-334.000.

Pommier, Jean, to Compagnie Generale des Etablissements Michelin. Tire with prestressed radial carcass reinforcement. 4,481,994, Cl. 152-353.00R.

Popescu, Mihai: *See*—
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, 4,482,376, Cl. 75-10.00R.

Popovici, Constantin: *See*—
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, 4,482,376, Cl. 75-10.00R.

Porche, Michael N.; and Beauregard, Louis G., to Rig Efficiency, Inc. Closed loop power factor control for drilling rigs. 4,482,857, Cl. 323-205.000.

Potdevin Machine Company: *See*—
Ujhelyi, Gaspar, 4,481,751, Cl. 53-412.000.

Power Conversion, Inc.: *See*—
Rosansky, Martin G.; and Jagid, Bruce, 4,482,615, Cl. 429-94.000.

Poyer, Myron E.: *See*—
Reinker, Richard P.; Poyer, Myron E.; and Lester, James M., 4,481,778, Cl. 62-45.000.

PPG Industries, Inc.: *See*—
Saunders, John B., Jr.; Schimmel, Karl F.; and Dowbenko, Rostyslaw, 4,482,691, Cl. 528-69.000.

Precision Fukuhara Works, Ltd.: *See*—
Sawazaki, Masatoshi, 4,481,794, Cl. 66-132.00T.

Preda, Stefano: *See*—
Petrini, Valentino; and Preda, Stefano, 4,482,517, Cl. 264-143.000.

Prentice, Ian, to British Gas Corporation. Pipeline gauging vehicles. 4,481,816, Cl. 73-432.00R.

Prevot, Claude: *See*—
Rovel, Jean-Marie; Prevot, Claude; and Nicol, Roger, 4,482,458, Cl. 210-603.000.

Price, Leonard W., to Hughes Helicopters, Inc. Single barrel externally powered gun. 4,481,858, Cl. 89-11.000.

Pricenski, Theodore J.; and Parent, Edward D., to GTE Products Corporation. Evaporation heater. 4,482,799, Cl. 219-275.000.

Printex: *See*—
Bousquet, Hubert; Egraz, Jean Bernard; and Ravet, Georges, 4,482,606, Cl. 428-402.200.

Priscu, John C.: *See*—
Neelameggham, Ramaswami; and Priscu, John C., 4,482,607, Cl. 428-403.000.

Prochaska, William J. Truck ladder. 4,482,029, Cl. 182-96.000.

Procter & Gamble Company, The: *See*—
Sagel, Paul J.; and Trinh, Toan, 4,482,593, Cl. 428-90.000.

Product Originators, Inc.: *See*—
La Fata, John E.; and Cuccio, John D., 4,481,731, Cl. 446-15.000.

Prosper, Lawrence J.: *See*—
Golobic, Robert A.; and Prosper, Lawrence J., 4,482,253, Cl. 366-147.000.

Proulx, Richard W.: *See*—
Erickson, Jack A.; Davich, Luke J.; and Proulx, Richard W., 4,481,885, Cl. 102-467.000.

Pryor, Timothy R., to Diffracto Ltd. Robot tractors. 4,482,960, Cl. 364-424.000.

Psi Star, Inc.: *See*—
Battey, James F., 4,482,425, Cl. 156-637.000.

Puech, Claude: *See*—
Papuchon, Michel; Puech, Claude; and Arditty, Herve , 4,482,248, Cl. 356-346.000.

Puri, Vijay K., to Lokring. Apparatus and method for making a tube connection. 4,482,174, Cl. 285-382.200.

Qdot Corporation: *See*—
Grover, George M., 4,482,004, Cl. 165-1.000.

Quaker Industries, Inc.: *See*—
Cwik, Norbert L., 4,482,164, Cl. 280-47.240.

Quella, Ferdinand; and Schmidt, Hans-Friedrich, to Siemens Aktiengesellschaft. Stabilized sulfur-containing resins, such as polyphenylene sulfide and method of producing the same. 4,482,683, Cl. 525-537.000.

Questor Corp.: *See*—
Zwilling, Brian R., 4,482,151, Cl. 272-123.000.

Quick-Mount Manufacturing Company, Inc.: *See*—
Grashow, Joseph, 4,482,122, Cl. 248-514.000.

Quoirin, Jean B., to Thomson-CSF. Monolithic integrated circuit equivalent to a transistor associated with three antisaturation diodes. 4,482,911, Cl. 357-46.000.

Qvarnstrom, Bengt G. L., to Stora Kopparbergs Bergslags AB. Method and apparatus for automatically handling reusable seedling units. 4,481,893, Cl. 111-2.000.

R. W. Beckett Corporation: *See*—
Chakrawarti, Shekhar; Delancey, Warren; and Haydn, Michael, 4,482,291, Cl. 415-25.000.

Radiation Dynamics, Inc.: *See*—
Burgess, Robert G., 4,482,811, Cl. 250-492.300.

Radus, Raymond J.: *See*—
Wolf, Joachim E.; Watson, Paul H.; and Radus, Raymond J., 4,482,945, Cl. 363-129.000.

Rainer, Norman B.; and Keritsis, Gus D., to Philip Morris Incorporated. Combustible carbon filter and smoking product. 4,481,958, Cl. 131-331.000.

RainSoft Water Conditioning Company: *See*—
Grayson, John R., 4,482,456, Cl. 210-134.000.

Ramachandran, Venkataraman, to Ethyl Corporation. Preparation of biaryl compounds. 4,482,502, Cl. 260-465.00G.

Ramey, Alford J.: *See*—
Baker, Ray W.; Pawlak, Donald A.; and Ramey, Alford J., 4,482,129, Cl. 251-334.000.

Ranade, Gautam R., to Occidental Chemical Corporation. Process of manufacturing diaryl esters of dicarboxylic acids. 4,482,732, Cl. 560-86.000.

Ranade, Gautam R., to Occidental Chemical Corporation. Process of manufacturing diaryl esters of dicarboxylic acids. 4,482,733, Cl. 560-86.000.

Randazza, John B., to Maine Yankee Atomic Power Company. Fuel pin transfer tool. 4,482,520, Cl. 376-261.000.

Rankin, Todd S.: *See*—
McCain, William B.; and Rankin, Todd S., 4,482,142, Cl. 270-54.000.

Rapaport, Stanley; and Cachat, Francis J., to Plasti-Kote Company, Inc. Water-soluble aerosol paint compositions. 4,482,662, Cl. 523-504.000.

Rassieur, Charles L., to Central Mine Equipment Company. Drill string joint. 4,482,173, Cl. 285-330.000.

Rath, R. Carl: *See*—
Schweer, Carl; and Rath, R. Carl, 4,482,844, Cl. 315-194.000.

Ravet, Georges: *See*—
Bousquet, Hubert; Egraz, Jean Bernard; and Ravet, Georges, 4,482,606, Cl. 428-402.200.

Ray, Michael J.: *See*—
Gavagan, James A.; Petersen, Carl M., III; and Ray, Michael J., 4,482,137, Cl. 267-157.000.

RayGo, Inc.: *See*—
Copie, Fernand, 4,482,285, Cl. 414-589.000.

Raynes, Edward P.: *See*—
Carr, Neil; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Raynes, Edward P., 4,482,472, Cl. 252-299.100.

Raytheon Company: *See*—
Smith, Irl W., Jr.; and Dorschner, Terry A., 4,482,249, Cl. 356-350.000.

RCA Corporation: *See*—
Acampora, Alfonse, 4,482,916, Cl. 358-27.000.
Filliman, Paul, 4,482,921, Cl. 358-243.000.
Hampel, Daniel; and Bradshaw, John L., 4,483,017, Cl. 382-17.000.
Maynard, Richard B.; Moscony, John J.; and Saunders, Margaret H., 4,482,426, Cl. 156-640.000.
McGinn, Joseph T.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,482,422, Cl. 156-612.000.
VanBreemen, Bertram, 4,482,206, Cl. 350-128.000.

Readhead, John B.: *See*—
Blackburn, Anthony; and Readhead, John B., 4,482,807, Cl. 250-334.000.

Rebhan, James R.; Rebhan, John C.; and Hallstrom, Arthur, to National Enclosure Systems, Inc. Pivoting gate. 4,481,737, Cl. 49-385.000.

Rebhan, John C.: *See*—
Rebhan, James R.; Rebhan, John C.; and Hallstrom, Arthur, 4,481,737, Cl. 49-385.000.

Recordati, S. A., Chemical & Pharmaceutical Co.: *See*—
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; and Graziani, Gabriele, 4,482,561, Cl. 424-258.000.

Redman, Howard E.; and Snowman, Roger O., to Mathewson Corporation. Apparatus for separating nested coils. 4,482,044, Cl. 198-388.000.

Redmon, Larry. Panel punch. 4,481,700, Cl. 29-407.000.

Reesink, Johan B., to Akzo N.V. Thermosetting coating composition containing a blocked acid as catalyst. 4,482,698, Cl. 528-242.000.

Reeve, Thomas S.: *See*—
Martin, Reginald, deceased; White, Winifred, legal representative; Edwards, Nora, legal representative; Brookes, John W.; and Reeve, Thomas S., 4,482,364, Cl. 55-158.000.

Reeves, Russell R., to Apace Research Limited. Emulsions of liquid hydrocarbons with water and/or alcohols. 4,482,666, Cl. 524-389.000.

Reffert, Rudi W.: *See*—
Hambrecht, Juergen; Reffert, Rudi W.; Muench, Volker; Echte, Adolf; and Swoboda, Johann, 4,482,705, Cl. 528-486.000.

Reheat AB: *See*—
Lindahl, Lars; and Carlsson, Bengt, 4,482,089, Cl. 228-173.00C.

Reichel, Curtis J.; Patton, John T., Jr.; and Narayan, Thirumurti, to BASF Wyandotte Corporation. Process for the preparation of haloalkoxymethylmelamine adduct dispersions and polyurethane compositions prepared therefrom. 4,482,651, Cl. 521-115.000.

Reichhold Chemicals, Inc.: *See*—
Peters, Edwin L., 4,481,989, Cl. 144-335.000.

Reid, Philip L., to Zabel, Jack H., Jr. Tire valve. 4,481,970, Cl. 137-223.000.

Reilly Tar & Chemical Corp.: *See*—
Toomey, Joseph E., Jr., 4,482,437, Cl. 204-74.000.
Toomey, Joseph E., Jr., 4,482,439, Cl. 204-78.000.

Reimann, Herbert. Target indicating and shot scoring system for firing range. 4,482,325, Cl. 434-21.000.

Reindl, Werner: *See*—
Grewal, Virinder; and Reindl, Werner, 4,482,209, Cl. 350-642.000.
Reinhard, George G.: *See*—
Osgood, Gordon L.; and Reinhard, George G., 4,482,352, Cl. 44-53.000.
Reinicke, Robert H., to Consolidated Controls Corporation. Apparatus for infusing medication into the body. 4,482,346, Cl. 604-152.000.
Reinker, Richard P.; Poyer, Myron E.; and Lester, James M., to Ball Corporation. Thermally disconnecting passive parallel orbital supports. 4,481,778, Cl. 62-45.000.
Reiss, Linda. Hot/cold food dispensing machine. 4,482,078, Cl. 221-150.0HC.
Reiss, Wolfgang: *See*—
Herrmann, Guenter; Frommer, Elmar; Paetsch, Juergen; Reiss, Wolfgang; and Winderl, Siegfried, 4,482,764, Cl. 568-864.000.
Reiter, Lawrence A., to Pfizer Inc. Process for preparation of 4-acetyl-2-substituted-imidazoles. 4,482,723, Cl. 548-343.000.
Reiter, Stephen E.: *See*—
Knudsen, Ronald D.; and Reiter, Stephen E., 4,482,640, Cl. 502-155.000.
Rempel, Dieter: *See*—
Neuray, Dieter; Nouvertne, Werner; Binsack, Rudolf; Rempel, Dieter; and Muller, Peter R., 4,482,672, Cl. 525-67.000.
Renault, Christian, to Pharmindustrie. Process for the preparation of N,N-dimethyl-10-[1-aza-[2,2,2]-bicyclo-3-octyl]-10H-2-phenothiazine sulphonamide. 4,482,711, Cl. 544-42.000.
Rendgen, Walter, to Robert Seuffer GmbH & Co. Push button switch. 4,482,791, Cl. 200-153.00J.
Repa, Otto: *See*—
Zanner, Georg; and Repa, Otto, 4,481,863, Cl. 89-138.000.
Repski, Roman. Soil sampler. 4,482,021, Cl. 175-209.000.
Research Foundation for Mental Hygiene, Inc.: *See*—
Tamir, Hadassah; Karpiak, Stephen E.; and Wilchek, Meir, 4,482,567, Cl. 424-274.000.
Research One Limited Partnership: *See*—
Satkowski, John A.; Scheetz, Barry; Rizer, Janine M.; and Gotzmer, Carl, 4,482,385, Cl. 106-97.000.
Reul, Joseph A.: *See*—
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,471, Cl. 252-186.310.
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,477, Cl. 252-540.000.
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,482,630, Cl. 435-187.000.
Reuland Electric Company: *See*—
Bhavsar, Manubhai R., 4,482,853, Cl. 318-778.000.
Reuter, Hans J., to Mecan Arbed S.a.r.l. Rack-changing apparatus for a continuous casting installation. 4,482,002, Cl. 164-442.000.
Reuter, Herbert; Pioch, Lothar; Schmid, Karl-Heinz; and Seiter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Viscosity modifiers for concentrated surfactants. 4,482,470, Cl. 252-162.000.
Reuter, Reinhold J., to General Motors Corporation. Variable-permeability pattern coating for lost foam casting. 4,482,000, Cl. 164-34.000.
Rhythm Watch Company Limited: *See*—
Makuta, Shunichi; Miyasaka, Hiroshi; and Takebe, Katsuhiko, 4,481,852, Cl. 84-1.030.
Richards, Elmer A., to Eaton Corporation. Multiple identical countershaft powershift transmission. 4,481,836, Cl. 74-331.000.
Richardson, Edwin A., to Shell Oil Company. Acidizing with chemically heated weak acid. 4,482,016, Cl. 166-300.000.
Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. Antifungal amide and urea derivatives of (3-amino-2-aryl-2-hydroxyprop-1-yl)-1H-1,2,4-triazoles. 4,482,558, Cl. 424-251.000.
Richardson, Robert; and Barker, Anthony T., to Marconi Company Limited, The. Pulse circuits. 4,482,816, Cl. 307-106.000.
Richter Gedeon Vegyeszeti Gyar R.T.: *See*—
Boor, Anna; Toth, Jozsef; Szen, Tamas; Gabor, Laszlo; Major nee Feistner, Piroska; and Holly, Sandor, 4,482,494, Cl. 260-397.400.
Ricoh Co., Ltd.: *See*—
Hibi, Kunio; Kaneko, Tamaki; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,482,147, Cl. 271-229.000.
Rider, Frederick H., Jr.; and List, Joseph O., to General Motors Corporation. Manually operable latch for hinged pull-down member. 4,482,176, Cl. 292-87.000.
Riechers, Daniel: *See*—
Huber, Guntram; Fischer, Wolfgang; Haeberle, Fritz; Kleiner, Horst; Riechers, Daniel; Klie, Wolfgang; and Tomforde, Johann, 4,482,180, Cl. 293-120.000.
Riederer, Stephen J.: *See*—
Keyes, Gary S.; Riederer, Stephen J.; Lambert, Thomas W.; and Stone, Barry N., 4,482,918, Cl. 358-111.000.
Rieger, Hansjorg W.; and Weidler, Erhard A., to RUD-Kettenfabrik Rieger & Dietz Gmbh u. Co. Device for tire protection and/or skid protection for vehicle tires. 4,481,990, Cl. 152-172.000.
Rieter Machine Works Ltd.: *See*—
Oswald, Heinz; and Vetterli, Walter, 4,482,099, Cl. 242-19.000.
Wurmli, Arthur, 4,481,764, Cl. 57-125.000.
Rig Efficiency, Inc.: *See*—
Porche, Michael N.; and Beauregard, Louis G., 4,482,857, Cl. 323-205.000.
Rigby, Eugene B., to International Business Machines Corporation. Bonding method for producing very thin bond lines. 4,482,418, Cl. 156-276.000.
Riou, Claude R.; and Fayard, Jean F., to Societe Anonyme: Aussedat-Rey. Color developers and thermographic record compositions containing them. 4,482,378, Cl. 106-14.500.
Risko, Donald G., to Extrude Hone Corporation. Capacitance measurement probe. 4,482,860, Cl. 324-61.00P.
Ritschel, Werner; Diery, Helmut; and Hille, Martin, to Hoechst Aktiengesellschaft. Bisimidazolines. 4,482,724, Cl. 548-350.000.
Ritsko, Joseph E.; and Acla, Howard L., to GTE Products Corporation. Recovery of tungsten and molybdenum from sulfur-bearing material. 4,482,526, Cl. 423-61.000.
Ritz, Jurgen: *See*—
Just, Christoph; Ritz, Jurgen; and Zimmermann, Rolf, 4,482,674, Cl. 525-124.000.
Rival Manufacturing Company: *See*—
Minton, Paul, 4,482,832, Cl. 310-216.000.
Riviezzo, Vincent F.: *See*—
Ouellette, Paul J.; and Riviezzo, Vincent F., 4,482,197, Cl. 339-17.00C.
Rizer, Janine M.: *See*—
Satkowski, John A.; Scheetz, Barry; Rizer, Janine M.; and Gotzmer, Carl, 4,482,385, Cl. 106-97.000.
Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of carboxylic acids. 4,482,497, Cl. 260-413.000.
Roach, Charles J., to Pall Corporation. Vortex air cleaner and self-cleaning barrier filter assembly for supercharged engines. 4,482,365, Cl. 55-218.000.
Roantree, Michael L.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Nitro pyrrols and their pharmaceutical use. 4,482,563, Cl. 424-267.000.
Robbins, Bobbie L.; and Norton, Gary L., to Collins Industries, Inc. Automatic hand rail. 4,482,284, Cl. 414-539.000.
Robert Bosch GmbH: *See*—
Beck, Siegfried; Holfelder, Jurgen; Straub, Steffen; and Schnaker, Aloys, 4,482,191, Cl. 303-52.000.
Hafner, Martin; Hofmann, Karl; Schlagenhauf, Josef; Stumpp, Gerhard; and Trachte, Dietrich, 4,482,093, Cl. 239-73.000.
Knapp, Heinrich; Sauer, Rudolf; Hans, Waldemar; Linssen, Mathias; Peczkowski, Jurgen; and Krauss, Rudolf, 4,481,699, Cl. 29-157.10R.
Kudelski, Stefan; and Schlup, Jean-Claude, 4,482,901, Cl. 346-1.100.
Leiber, Heinz, 4,482,192, Cl. 303-100.000.
Wessel, Wolf, 4,482,823, Cl. 307-519.000.
Robert Linkletter Associates, Inc.: *See*—
Agbay, Albert J.; and Thomas, Ralph H., Sr., 4,482,068, Cl. 215-225.000.
Robert Seuffer GmbH & Co.: *See*—
Rendgen, Walter, 4,482,791, Cl. 200-153.00J.
Roberts, Mark T., to Nelson Industries, Inc. Air cleaning assembly including a fastening assembly having a novel wing nut construction. 4,482,368, Cl. 55-480.000.
Robles, Benjamin R.: *See*—
Bresson, Clarence R.; Parlman, Robert M.; and Robles, Benjamin R., 4,482,480, Cl. 252-61.000.
Roche, Marcel, to Thomson-CSF. Process for manufacturing integrated bi-polar transistors of very small dimensions. 4,481,706, Cl. 29-577.00C.
Roche, Thomas J.: *See*—
Oza, Bharat J.; and Roche, Thomas J., 4,482,819, Cl. 307-269.000.
Rock-Tenn Company: *See*—
Wischusen, Henry, III, 4,482,052, Cl. 206-409.000.
Rockwell Golde GmbH: *See*—
Grimm, Rainer; and Roos, Rudolf, 4,482,183, Cl. 296-217.000.
Rockwell International Corporation: *See*—
Nyhus, Orville K., 4,482,873, Cl. 333-116.000.
Scott, Harry A., 4,481,703, Cl. 29-526.00A.
Tzeng, Chin-Pyng J., 4,482,824, Cl. 307-530.000.
Rockwell-Rimoldi S.p.A.: *See*—
Della Torre, Giancarlo, 4,482,143, Cl. 271-18.300.
Glassby, Kenneth B., 4,482,144, Cl. 271-21.000.
Rodman, Brenda K.: *See*—
Stephens, William D.; and Rodman, Brenda K., 4,482,407, Cl. 149-19.400.
Stephens, William D.; and Rodman, Brenda K., 4,482,408, Cl. 149-19.400.
Stephens, William D.; and Rodman, Brenda K., 4,482,409, Cl. 149-19.400.
Rodriguez, Jose ; and Cassanelli, Robert, to Societe Cassanelli & Cie. Fire adjustment device designed to be mounted on the end of a gun barrel. 4,481,861, Cl. 89-41.00A.
Roedel, Hilmar: *See*—
Dinkel, Rolf; Roedel, Hilmar; and Grayson, James I., 4,482,717, Cl. 546-251.000.
Roediger, Hanns, to Techtransfer GmbH & Co. KG. Method and apparatus for aerobic decomposition of organic solids. 4,482,633, Cl. 435-311.000.
Roemer, Dietmar; Ruhland, Michael; Zeugner, Horst; Milkowski, Wolfgang; and Liepmann, Hans, to Kali-Chemie Pharma GmbH. Analgesic pharmaceutical compositions containing 5-phenyl-1,4-benzo diazepine compounds and a method of using same. 4,482,548, Cl. 424-244.000.
Roffi, Roberto: *See*—
Zullo, Antonio; and Roffi, Roberto, 4,481,839, Cl. 74-569.000.
Rogers, Lloyd W., Jr.: *See*—
Tilly, Thomas; and Rogers, Lloyd W., Jr., 4,482,188, Cl. 297-473.000.

Rolfes, Thomas A. Universal hip stabilization device. 4,481,941, Cl. 128-87.00R.

Rolls-Royce Limited: *See*—
Perry, Derick A., 4,482,293, Cl. 415-219.00R.

Roos, Rudolf: *See*—
Grimm, Rainer; and Roos, Rudolf, 4,482,183, Cl. 296-217.000.

Roossine, Isaiah C.; and Wirtz, Willem. Flexible light strip assembly. 4,482,944, Cl. 362-418.000.

Rosansky, Martin G.; and Jagid, Bruce, to Power Conversion, Inc. Lithium anode comprising copper strip in contact with lithium body and lithium-sulfur dioxide battery utilizing same. 4,482,615, Cl. 429-94.000.

Roseman Mower Corporation: *See*—
Carr, Jack, 4,481,755, Cl. 56-7.000.

Rosemount Inc.: *See*—
Frick, Roger L., 4,481,967, Cl. 137-85.000.

Rosenberg, Robert: *See*—
Hovel, Harold J.; and Rosenberg, Robert, 4,482,906, Cl. 357-16.000.

Rosenfeld, Daniel D.; and Barthomeuf, Denise M., to Exxon Research & Engineering Co. Separation of ortho aromatic isomers by selective adsorption with an aluminophosphate. 4,482,776, Cl. 585-828.000.

Rosilio, Andre : *See*—
Lorin, Andre ; Rosilio, Andre ; and Tanguy, Jean, 4,482,581, Cl. 427-79.000.

Ross, David G., to AT&T Bell Laboratories. Analog multiplier circuit including opposite conductivity type transistors. 4,482,977, Cl. 364-841.000.

Roth, Edgar: *See*—
Bruder, Stephen; Higby, Philip; and Roth, Edgar, 4,481,985, Cl. 141-1.000.

Rothgery, Eugene F., to Olin Corporation. Process for preparing semicarbazide hydrochloride. 4,482,738, Cl. 564-37.000.

Rovel, Jean-Marie; Prevot, Claude; and Nicol, Roger, to Degremont. Process and apparatus for the anaerobic treatment of waste water in a filter including granular material. 4,482,458, Cl. 210-603.000.

Rovetta, Alberto, to Alfa Romeo Auto S.p.A. Mechanical arm. 4,482,288, Cl. 414-728.000.

Rowe International, Inc.: *See*—
Steiner, Larry E., 4,482,058, Cl. 209-534.000.

Rowland, Donald G.; and Heck, Rhomie L., III, to Uniroyal, Inc. Blowing agent compositions. 4,482,650, Cl. 521-89.000.

Royal Keg Cooler Corporation: *See*—
German, Gary L., 4,481,791, Cl. 62-400.000.

Roylance, Byron D.: *See*—
Roylance, William H.; and Roylance, Byron D., 4,482,845, Cl. 315-360.000.

Roylance, William H.; and Roylance, Byron D., to Roylance, William H. Process for preventing inadvertent actuation of controls. 4,482,845, Cl. 315-360.000.

Rozendaal, Adrianus: *See*—
Boot, Jacobus; Rozendaal, Adrianus; and Schijf, Robert, 4,482,576, Cl. 426-603.000.

Rubbert, Bernhard: *See*—
Blum, Rainer; Lehner, August; and Rubbert, Bernhard, 4,482,664, Cl. 524-212.000.

Rubertus, Roland W.; and Tait, William C., to Minnesota Mining and Manufacturing Company. Method of constructing an LC network. 4,482,874, Cl. 333-185.000.

Rubet, Roland: *See*—
Vergues, Jacques; and Rubet, Roland, 4,482,828, Cl. 310-83.000.

RUD-Kettenfabrik Rieger & Dietz Gmbh u. Co.: *See*—
Rieger, Hansjorg W.; and Weidler, Erhard A., 4,481,990, Cl. 152-172.000.

Rudich, George, Jr.; Beeson, Charles F.; and Bartley, Gary L., to Johnson Service Company. Electrically-controlled rotary actuator. 4,482,847, Cl. 318-9.000.

Rudolph, Harald, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Device for adjusting ink or moisture-application rolls. 4,481,882, Cl. 101-148.000.

Ruhl, Robert C., to Kennecott Corporation. Cold rolling mill for metal strip. 4,481,800, Cl. 72-10.000.

Ruhland, Michael: *See*—
Roemer, Dietmar; Ruhland, Michael; Zeugner, Horst; Milkowski, Wolfgang; and Liepmann, Hans, 4,482,548, Cl. 424-244.000.

Rus, Harald; and Enzinger, Georg, to Rus, Harald. Rotary valve for internal-combustion engine. 4,481,917, Cl. 123-190.00C.

Rutten, Peter T.; and Kalinowski, James E., to Blue Harbor, Inc. Sea anchor. 4,481,900, Cl. 114-311.000.

Rutter, Christopher C.; and Hill, Gerald R., to Champion International Corporation. Bag filler-capper. 4,481,753, Cl. 53-471.000.

Ryan, Philip M., to International Business Machines Corporation. Online realignment of memory faults. 4,483,001, Cl. 371-11.000.

Ryczek, Lawrence J.; and Van Zeeland, Donald L., to Eaton Corporation. Universal field convertible 3-wire switch. 4,482,818, Cl. 307-257.000.

Ryoji, Takabe: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.

Ryono, Denis E.: *See*—
Ondetti, Miguel A.; and Ryono, Denis E., 4,482,725, Cl. 548-533.000.

S.N.E.C.M.A.: *See*—
Fournier, Jacques M. A., 4,482,859, Cl. 324-61.0QS.

Saab Training Systems Aktiebolag: *See*—
Karlsson, Jorgen B., 4,482,156, Cl. 273-406.000.

Saam, John C.; and Falender, James R., to Dow Corning Corporation. Method of polymerizing polydiorganosiloxane fluid-filler mixture using sulfuric or sulfonic acids. 4,482,670, Cl. 524-860.000.

Sabel, Herbert J. Rotary case loading machine. 4,481,752, Cl. 53-448.000.

Safier, Robert S.: *See*—
D'Alessio, Michael S.; and Safier, Robert S., 4,481,748, Cl. 52-638.000.

Sagai, Hitoshi: *See*—
Sakakibara, Hideo; Satoi, Shuzo; Awata, Masashi; Sagai, Hitoshi; Hayashi, Mitsuo; Muto, Naoki; and Takada, Masaki, 4,482,707, Cl. 536-16.800.

Sagami Chemical Research Center: *See*—
Matsumoto, Masakatsu; and Ito, Satoru, 4,482,493, Cl. 260-396.00R.

Sagara, Iwao; and Kataoka, Keisuke, to OKI Electric Industry Co. Ltd. Telephone-call prohibit circuit. 4,482,787, Cl. 179-90.00D.

Sagel, Paul J.; and Trinh, Toan, to Procter & Gamble Company, The. Flocked floor mat with hydrophilic adhesive. 4,482,593, Cl. 428-90.000.

Sainsbury, Clive R.: *See*—
Ironside, John M.; Deller, Nigel A.; Sainsbury, Clive R.; and Weston, Paul, 4,481,844, Cl. 74-866.000.

Saito, Kenzo, to Sony Corporation. Tape cassette. 4,482,104, Cl. 242-198.000.

Saito, Kouji, to Mitsubishi Denki Kabushiki Kaisha. Drawer type enclosed switchboard with automatic grounding device. 4,482,936, Cl. 361-336.000.

Saito, Motoyuki: *See*—
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,482,257, Cl. 368-88.000.

Saito, Norio: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; Shiroi, Takashi; and Tanaka, Akira, 4,482,491, Cl. 260-245.400.

Saito, Tadao; and Ogawa, Riichi, to Yoshino Kogyosho Co., Ltd. Synthetic resin bottle. 4,482,067, Cl. 215-12.00R.

Saito, Yuichi: *See*—
Furukawa, Hiroshi; Saito, Yuichi; Imai, Akio; Yoshida, Nobuyuki; and Okamoto, Yasushi, 4,482,678, Cl. 525-236.000.

Saitoh, Teruo: *See*—
Tsukada, Tsutomu; Wani, Etsuo; Ukai, Katsumi; and Saitoh, Teruo, 4,482,419, Cl. 156-345.000.

Sakai, Hiroshi: *See*—
Takeuchi, Fumio; Takahashi, Masao; and Sakai, Hiroshi, 4,482,403, Cl. 149-2.000.

Sakai, Masahiro: *See*—
Nomaguchi, Tamotsu; and Sakai, Masahiro, 4,482,008, Cl. 165-29.000.

Sakai, Masao; Suzuki, Yasuhiko; and Sugimoto, Makoto, to NGK Spark Plug Co., Ltd. Resistor composition for resistor-incorporated spark plugs. 4,482,475, Cl. 252-506.000.

Sakai, Masao, to Hitachi, Ltd. Magnetron with magnetic yoke having annular projection. 4,482,870, Cl. 331-86.000.

Sakakibara, Hideo; Satoi, Shuzo; Awata, Masashi; Sagai, Hitoshi; Hayashi, Mitsuo; Muto, Naoki; and Takada, Masaki, to Toyo Jozo Kabushiki Kaisha. Aminoglycoside antibiotic saccharocins. 4,482,707, Cl. 536-16.800.

Sakakibara, Kenji: *See*—
Shiramizu, Kousuke; Awano, Yoshiro; Takeyama, Hiroyuki; Sakakibara, Kenji; Okada, Hiroji; and Yamagami, Hiromu, 4,482,797, Cl. 219-137.610.

Sakakibara, Shinsuke: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,482,289, Cl. 414-736.000.
Inaba, Hajimu; and Sakakibara, Shinsuke, 4,482,968, Cl. 364-513.000.

Sakamoto, Hideshi: *See*—
Fujishita, Kusuo; Sakamoto, Hideshi; Yamazawa, Tomio; and Yamaguchi, Junichi, 4,482,595, Cl. 428-95.000.

Sakata, Jiro; Hirai, Masana; and Yamamoto, Minoru, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method and apparatus for detecting the concentration of a component in a solution. 4,481,808, Cl. 73-61.10R.

Saki, Kunio: *See*—
Nagase, Yukihiko; Kawasaki, Tetsuo; Hiromatsu, Masato; Asanabe, Sadao; and Saki, Kunio, 4,481,867, Cl. 91-487.000.

Sakurai, Masao: *See*—
Yoshimi, Akiro; Takagi, Masashi; Sakurai, Masao; and Takemi, Akio, 4,482,007, Cl. 165-21.000.

Sakurai, Nobuo; and Moriya, Kikuo, to Amada Company, Limited. Method and apparatus for controlling the feeding of a bandsaw blade of horizontal bandsaw machines. 4,481,845, Cl. 83-13.000.

Sakurai, Toshiharu: *See*—
Teshima, Koichi; Yamada, Masakazu; Sakurai, Toshiharu; and Abe, Takemi, 4,482,611, Cl. 428-647.000.

Salerno, Alan F. Chuted mixer forming method. 4,481,698, Cl. 29-156.80R.

Sampsell, Jeffrey B.: *See*—
Piliavin, Michael A.; Sampsell, Jeffrey B.; and Penz, Perry A., 4,482,213, Cl. 350-334.000.

Samuelson, Michael A.; and Dick, James H., to General Motors-Holden's Limited. Cast vehicle wheel. 4,482,189, Cl. 301-6.0CS.

Sand, I. Daniel: *See*—
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,482,587, Cl. 428-35.000.
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,482,588, Cl. 428-35.000.

Sanders, Robert N.; and Laurent, Sebastian M., to Ethyl Corporation. Method of making zeolite Y. 4,482,530, Cl. 423-329.000.

Sandweiss, Varda E.; Stupak, Elliot; and Shapiro, Paul H., to Schering Corporation. Betamethasone dipropionate cream. 4,482,539, Cl. 424-81.000.

Sanfilippo, Aurora: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,482,565, Cl. 424-270.000.

Sanjana, Zal N.; and Marchetti, Joseph R., to Westinghouse Electric Corp. Toughened thermosetting compositions for composites. 4,482,659, Cl. 523-414.000.

Sankyo Company Limited: *See*—
Fujimoto, Koichi; Nakayama, Eiji; and Nakao, Hideo, 4,482,710, Cl. 544-28.000.

Sano, Atsushi: *See*—
Kato, Hironobu; Ichikawa, Masaru; Sano, Atsushi; Tanabe, Yoshiaki; and Nakano, Yoshiyuki, 4,482,231, Cl. 354-246.000.

Sano, Yasumasa, to NSK-Warner K.K. Webbing-lock mechanism suitable for use in vehicle seat belt. 4,482,102, Cl. 242-107.200.

Sano, Yasumasa; and Kawai, Osamu, to NSK-Warner K.K. Webbing-locking mechanism. 4,482,103, Cl. 242-107.200.

Sanofi: *See*—
Chekroun, Isaac; and Heymes, Alain, 4,482,718, Cl. 546-284.000.

Santen Pharmaceutical Co., Ltd.: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,482,709, Cl. 536-46.000.

Santroch, George; and Jirkovsky, Ivo, to American Home Products Corporation. Pyrazino[2',3'-3,4]pyrido[1,2-a]indole derivatives. 4,482,714, Cl. 544-343.000.

Sarcia, Domenico S., to CVI Incorporated. Cryogenic refrigerator. 4,481,777, Cl. 62-6.000.

Sasaki, Hideharu: *See*—
Yoshida, Tsugushi; Sasaki, Hideharu; Sawaki, Toru; and Shimada, Keizo, 4,482,603, Cl. 428-287.000.

Sasaki, Soji: *See*—
Kubota, Jun; Ishii, Junichi; and Sasaki, Soji, 4,481,822, Cl. 73-625.000.

Sasaki, Yoshiaki: *See*—
Kanayama, Hisayasu; Sasaki, Yoshiaki; Furuno, Naoki; Sasaoka, Yoshitaka; and Tokita, Osamu, 4,482,382, Cl. 106-90.000.

Sasaoka, Michio: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; Shiroi, Takashi; and Tanaka, Akira, 4,482,491, Cl. 260-245.400.

Sasaoka, Yoshitaka: *See*—
Kanayama, Hisayasu; Sasaki, Yoshiaki; Furuno, Naoki; Sasaoka, Yoshitaka; and Tokita, Osamu, 4,482,382, Cl. 106-90.000.

Sase, Yoshihiro: *See*—
Tominaga, Hiroshi; Sase, Yoshihiro; and Horiuchi, Shoichi, 4,482,808, Cl. 250-392.000.

Sasib S.p.A.: *See*—
Zullo, Antonio; and Roffi, Roberto, 4,481,839, Cl. 74-569.000.

Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., to McDonnell Douglas Corporation. Laser melt spin atomized metal powder and process. 4,482,375, Cl. 75-0.50C.

Satkowski, John A.; Scheetz, Barry; Rizer, Janine M.; and Gotzmer, Carl, to Research One Limited Partnership. Cementitious composite material with stainless steel particulate filler. 4,482,385, Cl. 106-97.000.

Sato, Hideki, to Tokyo Shibaura Denki Kabushiki Kaisha. X-Ray radiation control method and apparatus. 4,483,013, Cl. 378-112.000.

Sato, Kuninori: *See*—
Imahori, Seiichi; Niwa, Toshio; Okada, Itaru; and Sato, Kuninori, 4,482,490, Cl. 534-797.000.

Sato, Mitsuo; and Takahashi, Yuu, to Aida Engineering, Ltd. Balance device for a mechanical press. 4,481,834, Cl. 74-44.000.

Sato, Seiichi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

Sato, Shinichi: *See*—
Kudomi, Hiroyuki; and Sato, Shinichi, 4,482,682, Cl. 525-369.000.

Satoh, Ichiya: *See*—
Yoneyama, Takao; Satoh, Ichiya; Obara, Sanshiro; Inoue, Tomoaki; and Koga, Tsuguaki, 4,481,819, Cl. 73-593.000.

Satoi, Shuzo: *See*—
Sakakibara, Hideo; Satoi, Shuzo; Awata, Masashi; Sagai, Hitoshi; Hayashi, Mitsuo; Muto, Naoki; and Takada, Masaki, 4,482,707, Cl. 536-16.800.

Sauer, Rudolf: *See*—
Knapp, Heinrich; Sauer, Rudolf; Hans, Waldemar; Linssen, Mathias; Peczkowski, Jurgen; and Krauss, Rudolf, 4,481,699, Cl. 29-157.10R.

Saunders, John B., Jr.; Schimmel, Karl F.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Air-drying fatty acid-modified acrylic resins. 4,482,691, Cl. 528-69.000.

Saunders, Margaret H.: *See*—
Maynard, Richard B.; Moscony, John J.; and Saunders, Margaret H., 4,482,426, Cl. 156-640.000.

Savart, Bernard; and Ducournau, Alain, to Creusot-Loire. Low-blade inking mechanism with detachable ink duct troughs. 4,481,883, Cl. 101-363.000.

Sawa, Utazi: *See*—
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,482,501, Cl. 260-458.00C.

Sawada, Naotoshi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

Sawaki, Toru: *See*—
Yoshida, Tsugushi; Sasaki, Hideharu; Sawaki, Toru; and Shimada, Keizo, 4,482,603, Cl. 428-287.000.

Sawatari, Kiyoshi: *See*—
Fujimura, Takashi; Tomita, Yoshifumi; and Sawatari, Kiyoshi, 4,482,842, Cl. 313-634.000.

Sawazaki, Masatoshi, to Precision Fukuhara Works, Ltd. Yarn feeding apparatus for circular knitting machines. 4,481,794, Cl. 66-132.00T.

Sawtelle, Kenneth. Fire extinguishing attachment for chimney stacks. 4,481,933, Cl. 126-58.000.

Sawyer, Ernest R.: *See*—
Orsino, Joseph A.; Sawyer, Ernest R.; and Hollett, Ronald J., 4,482,618, Cl. 429-179.000.

Say, Donald L.: *See*—
Collins, Floyd K.; and Say, Donald L., 4,482,840, Cl. 313-446.000.

Saylor, Richard, to Electro-Nucleonics, Inc. Clinical analyzer. 4,482,251, Cl. 356-418.000.

Scarafile, Cosimo: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,482,565, Cl. 424-270.000.

Schad, Charles A., to Metric Corporation. Detector for a meter prover. 4,481,806, Cl. 73-3.000.

Schade, Gerhard: *See*—
Kuhnrich, Robert; Schade, Gerhard; and Elmenthaler, Bernd, 4,482,700, Cl. 528-279.000.

Schadlich, Gunther: *See*—
Moraw, Roland; and Schadlich, Gunther, 4,482,241, Cl. 355-10.000.

Schaedlich, Guenther: *See*—
Moraw, Roland; and Schaedlich, Guenther, 4,482,242, Cl. 355-10.000.

Schaefer, Klaus D., to Ernst Leitz Wetzlar GmbH. Device for correctively compensating the aperture error in reproducing systems. 4,482,220, Cl. 350-450.000.

Schafer, Robert: *See*—
Eberhard, Patrick; Mindt, Wolfgang; Palma, Jean-Pierre; Schafer, Robert; and Scharf, Robert, 4,481,804, Cl. 73-1.00G.

Schaffer, Stephen P., to J. M. Ney Company, The. Dental restorations using novel palladium silver alloy casting. 4,482,323, Cl. 433-207.000.

Schaffner, Carl P.: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 4,482,540, Cl. 424-116.000.

Schaidl, Hubert; and Herren, Dietmar, to Dorst-Maschinen und Anlagenbau Otto Dorst und Dipl.-Ing. Walter Schlegel GmbH & Co. Press for producing true-to-size workpieces using powder materials. 4,482,307, Cl. 425-78.000.

Scharf, Robert: *See*—
Eberhard, Patrick; Mindt, Wolfgang; Palma, Jean-Pierre; Schafer, Robert; and Scharf, Robert, 4,481,804, Cl. 73-1.00G.

Schartz, Charles O. Combine harvester. 4,481,756, Cl. 56-10.200.

Scheetz, Barry: *See*—
Satkowski, John A.; Scheetz, Barry; Rizer, Janine M.; and Gotzmer, Carl, 4,482,385, Cl. 106-97.000.

Schering Corporation: *See*—
Sandweiss, Varda E.; Stupak, Elliot; and Shapiro, Paul H., 4,482,539, Cl. 424-81.000.
Wright, John J.; and Cooper, Alan B., 4,482,564, Cl. 424-269.000.

Scheurenbrand, Dieter: *See*—
Stotz, Manfred; and Scheurenbrand, Dieter, 4,482,075, Cl. 220-86.00R.

Scheuter, Karl: *See*—
Fischer, Gerhard; and Scheuter, Karl, 4,482,923, Cl. 358-283.000.

Schiefer, Erwin, to Hilti Aktiengesellschaft. Expansion anchor assembly. 4,482,277, Cl. 411-42.000.

Schiele, August; and Huber, Wolfgang, to Keller and Knappich Wehrtechnik GmbH, Firma. Cartridge magazine for cannon mounted in tank turrets, especially armored car turrets. 4,481,860, Cl. 89-34.000.

Schijf, Robert: *See*—
Boot, Jacobus; Rozendaal, Adrianus; and Schijf, Robert, 4,482,576, Cl. 426-603.000.

Schimmel, Karl F.: *See*—
Saunders, John B., Jr.; Schimmel, Karl F.; and Dowbenko, Rostyslaw, 4,482,691, Cl. 528-69.000.

Schindler, Erich; and Maier, Franz, to Akzo N.V. Process for the production of an ultrafiltration membrane from polyamide. 4,482,514, Cl. 264-41.000.

Schlagenhauf, Josef: *See*—
Hafner, Martin; Hofmann, Karl; Schlagenhauf, Josef; Stumpp, Gerhard; and Trachte, Dietrich, 4,482,093, Cl. 239-73.000.

Schleese, Eckhardt; Gessner, Rudolf; and Manke, Horst, to Kabel-und Metalwerke Gutehoffnungshuette AG. Method of making a coaxial cable. 4,482,412, Cl. 156-51.000.

Schlegel, Albert, to Hoechst Aktiengesellschaft. Hardener for water glass cements. 4,482,380, Cl. 106-84.000.

Schlegel Corporation: *See*—
Norton, Edward W., 4,481,736, Cl. 49-373.000.

Schlicht, Raymond C.: *See*—
Karol, Thomas J.; Schlicht, Raymond C.; and Magaha, Harold S., 4,482,464, Cl. 252-51.50A.

Schlick, Horst, to VDO Adolf Schindling AG. Valve controlled pump driven by a motor. 4,482,301, Cl. 417-317.000.

Schluenz, Robert W., to Arizona Chemical Company. Light-colored hydrocarbon and terpene resins decolorized by iodine compounds. 4,482,688, Cl. 526-237.000.

Schlumberger Technology Corporation: *See*—
Minne, Jean-Claude, 4,482,959, Cl. 364-422.000.

Schlup, Jean-Claude: *See*—
Kudelski, Stefan; and Schlup, Jean-Claude, 4,482,901, Cl. 346-1.100.

Schmid, Karl-Heinz: *See*—
Reuter, Herbert; Pioch, Lothar; Schmid, Karl-Heinz; and Seiter, Wolfgang, 4,482,470, Cl. 252-162.000.

Schmid Laboratories: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 4,482,540, Cl. 424-116.000.

Schmidhammer, Ludwig; and Strasser, Rudolf, to Wacker Chemie GmbH. Removal of acetylene from products of 1,2-dichloroethane pyrolysis. 4,482,770, Cl. 570-219.000.

Schmidt, Erhard: *See*—
Kommoss, Klaus; and Schmidt, Erhard, 4,481,832, Cl. 73-862.080.

Schmidt, Hans-Friedrich: *See*—
Quella, Ferdinand; and Schmidt, Hans-Friedrich, 4,482,683, Cl. 525-537.000.

Schmidt, Karlwalter: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; and Schmidt, Karlwalter, 4,481,841, Cl. 74-661.000.

Schmidt, Robert: *See*—
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert, 4,482,736, Cl. 560-255.000.

Schmitt, Manfred; and Zitzelsberger, Emil, to Bopp & Reuther GmbH. Safety valve with friction means for damping valve vibration. 4,481,974, Cl. 137-514.000.

Schnaker, Aloys: *See*—
Beck, Siegfried; Holfelder, Jurgen; Straub, Steffen; and Schnaker, Aloys, 4,482,191, Cl. 303-52.000.

Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, to Boehringer Ingelheim KG. 4-Phenyl-4,5,6,7-tetrahydro-thieno [2,3-c]pyridines, compositions and use. 4,482,559, Cl. 424-256.000.

Schneider, Franz; Bergmann, Ewald; and Gering, Gerhard, to L. Schuler GmbH. Circuit arrangement for an adjusting drive for a press ram adjustment. 4,481,847, Cl. 83-530.000.

Schneider, Michael; and Knecht, Adolf, to Warner-Lambert Company. Antacid material based on magnesium aluminium hydroxide and the preparation thereof. 4,482,542, Cl. 424-157.000.

Schneider, Norbert: *See*—
Pachel, Max; and Schneider, Norbert, 4,481,711, Cl. 30-34.100.

Schneider, Rudolf: *See*—
Bauer, Walter; Farber, Heinrich; and Schneider, Rudolf, 4,482,233, Cl. 354-312.000.

Schonberger, Milton. Foam-fillable enclosure. 4,482,414, Cl. 156-79.000.

Schoolar, Richard B.; and Fote, Alfred A., to Aerospace Corporation, The. Thick extended contact photoconductor. 4,482,881, Cl. 338-15.000.

Schuster, Hans-Dieter: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; and Schmidt, Karlwalter, 4,481,841, Cl. 74-661.000.

Schuster, Hans H.; Dreher, Hermann; and Hambrecht, Juergen, to BASF Aktiengesellschaft. Avoiding an explosive gas phase in gas/-liquid reactions. 4,482,696, Cl. 528-212.000.

Schwarze, Werner; and Kleemann, Axel, to Degussa Aktiengesellschaft. Fungicidally active benzhydrol derivatives. 4,482,759, Cl. 568-809.000.

Schwarzmeier, Karl: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,482,515, Cl. 264-102.000.

Schweer, Carl; and Rath, R. Carl, to Wide-Lite International Corporation. Lamp dimmer. 4,482,844, Cl. 315-194.000.

Schweig, Dieter, to Bosch-Siemens Hausgeraete GmbH. Circuit arrangement for heating elements in cooking surfaces of ranges. 4,482,800, Cl. 219-446.000.

SCM Corporation: *See*—
Brown, George L.; de Sorgo, Miksa; and Spencer, Arthur T., 4,482,673, Cl. 525-119.000.
Woo, James T. K.; Ting, Vincent W.; and Marcinko, Richard M., 4,482,671, Cl. 525-31.000.

Scott, Harry A., to Rockwell International Corporation. Method of making rib structures for an airfoil. 4,481,703, Cl. 29-526.00A.

Seaberg, Richard D.: *See*—
Farmer, Stanley E.; and Seaberg, Richard D., 4,482,286, Cl. 414-607.000.

Seaney, Robert J.: *See*—
Forbes, George M.; and Seaney, Robert J., 4,482,890, Cl. 340-556.000.

Sebastiani, Gaetano: *See*—
Brandi, Roberto; Bucaneve, Giovanni; Della Greca, Antonio; Sebastiani, Gaetano; Toffano, Francesco; and Vielmo, Paolo, 4,482,274, Cl. 405-224.000.

Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The: *See*—
Carr, Neil; Constant, Jennifer; Gray, George W.; McDonnell, Damien G.; and Raynes, Edward P., 4,482,472, Cl. 252-299.100.

Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Gritain and Northern Ireland, The: *See*—
Bunce, Roger A.; and Studer, Rolf O., 4,482,521, Cl. 422-102.000.

Seig, Reinhard, to Chemische Werke Huels AG. Process for the orthomethylation of phenolic compounds. 4,482,758, Cl. 568-804.000.

Seino, Kazuyuki: *See*—
Ohtake, Yasuhisa; Seino, Kazuyuki; and Kamohara, Eiji, 4,482,334, Cl. 445-47.000.

Seiter, Wolfgang: *See*—
Reuter, Herbert; Pioch, Lothar; Schmid, Karl-Heinz; and Seiter, Wolfgang, 4,482,470, Cl. 252-162.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,482,420, Cl. 156-392.000.

Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Peruzzi, Armando, 4,481,864, Cl. 91-44.000.

Semplak, Ralph A.: *See*—
Dragone, Corrado; and Semplak, Ralph A., 4,482,898, Cl. 343-781.00P.

Serini, Volker; Mayska, Paul J.; Block, Hans-Dieter; and Freitag, Dieter, to Bayer Aktiengesellschaft. Polyphosphates and the production thereof. 4,482,693, Cl. 528-167.000.

Servitova, Linda: *See*—
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.

Setescak, Linda L.: *See*—
Martin, Lawrence L.; and Setescak, Linda L., 4,482,547, Cl. 424-244.000.

Seyferth, Dietmar; and Wiseman, Gary H., to Massachusetts Institute of Technology. Preceramic organosilazane polymers. 4,482,669, Cl. 524-442.000.

Shapiro, Paul H.: *See*—
Sandweiss, Varda E.; Stupak, Elliot; and Shapiro, Paul H., 4,482,539, Cl. 424-81.000.

Sharp Kabushiki Kaisha: *See*—
Kamuro, Setsufumi; and Masaki, Yoshifumi, 4,482,822, Cl. 307-468.000.
Morimoto, Masafumi; Yanagiuchi, Shigenobu; and Akizuki, Noboru, 4,482,981, Cl. 364-900.000.
Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, 4,482,212, Cl. 350-334.000.
Tateishi, Iwao; Mizuta, Takemi; Yokoyama, Tatuo; and Kakutani, Nobuyasu, 4,482,965, Cl. 364-467.000.

Shaw, David G., to General Electric Company. Blends of branched chain phthalate esters and halogenated benzene compounds. 4,482,478, Cl. 252-579.000.

Shawen, Harley J.; and Marvin, Richard P., to NCR Corporation. Record media dispensing apparatus. 4,482,057, Cl. 209-534.000.

Sheaffer, Benjamin L., to Brunswick Corporation. Stratified-charge two-stroke cycle engine. 4,481,910, Cl. 123-73.00R.

Sheaffer, Benjamin L.; and Griffiths, John M., to Brunswick Corporation. Stratified-charge cross-flow scavenged two-stroke cycle engine. 4,481,911, Cl. 123-73.00R.

Sheldon, Bernard G.; Wingard, Robert E., Jr.; Weinshenker, Ned M.; and Dawson, Daniel J., to Dynapol. Quaternary ammonium group-containing polymers having antimicrobial activity. 4,482,680, Cl. 525-331.400.

Shell, John F.: *See*—
Ferguson, Frank W.; Shell, John F.; and Hale, Steven D., 4,482,328, Cl. 434-310.000.

Shell Oil Company: *See*—
Karim, Karl A., 4,482,428, Cl. 156-668.000.
Mink, Bernardus H., 4,482,363, Cl. 55-69.000.
Richardson, Edwin A., 4,482,016, Cl. 166-300.000.

Shepherd, Charles G., to B. D. Wait Co. Limited. Grill lifter. 4,482,181, Cl. 294-12.000.

Shepherd, Freddie A.: *See*—
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,482,587, Cl. 428-35.000.
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,482,588, Cl. 428-35.000.

Sheppard, Howard H. Method of providing a soldered electrical connection and the electrical connection. 4,482,782, Cl. 174-94.00R.

Sherman, John D.: *See*—
Chao, Chien C.; and Sherman, John D., 4,482,761, Cl. 568-833.000.

Shiba, Kazuo: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,481,742, Cl. 51-165.800.

Shibayama, Shigeki: *See*—
Nakayama, Nobutoshi; Ito, Yukinobu; Nishihara, Eitaro; Iwata, Kazuhide; and Shibayama, Shigeki, 4,482,958, Cl. 364-414.000.

Shigeta, Masatomo; Isii, Yosio; and Hoshi, Akio, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Sumitomo Metal Industries, Limited. Process for preparing raw material for producing carbon material. 4,482,452, Cl. 208-177.000.

Shigyo, Hiromichi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato,

Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

Shih, Kelvin: *See*—
Hochstein, Peter A.; and Shih, Kelvin, 4,483,016, Cl. 381-120.000.

Shimada, Keizo: *See*—
Yoshida, Tsugushi; Sasaki, Hideharu; Sawaki, Toru; and Shimada, Keizo, 4,482,603, Cl. 428-287.000.

Shimada, Kenichi: *See*—
Oritsuki, Ryoji; Ichimura, Yukio; Kanai, Hiromi; and Shimada, Kenichi, 4,482,804, Cl. 250-211.00J.

Shimadzu Corporation: *See*—
Komoto, Akira, 4,482,022, Cl. 177-25.000.
Mito, Yasuhiro; and Iwasaki, Hideo, 4,482,966, Cl. 364-498.000.

Shimamura, Takeo: *See*—
Otsuka, Kenichi; and Shimamura, Takeo, 4,482,855, Cl. 318-809.000.

Shimano Industrial Company Limited: *See*—
Noda, Hideo, 4,482,105, Cl. 242-212.000.

Shimazaki, Takeshi: *See*—
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, 4,482,703, Cl. 528-322.000.

Shimizu, Keizo; Takeda, Katunobu; Furuichi, Tokinori; Oguri, Masao; and Ikoma, Junichi, to Hitachi, Ltd. Skip/arm servo system for a video disc player. 4,482,992, Cl. 369-221.000.

Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, to Citizen Watch Co., Ltd. Machine tool elevating and guiding apparatus. 4,481,742, Cl. 51-165.800.

Shimizu, Noboru: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.

Shimizu, Seiki: *See*—
Chiba, Akio; Shimizu, Seiki; Kuniya, Keiichi; and Onuki, Jin, 4,482,912, Cl. 357-67.000.

Shimizu, Takashi: *See*—
Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,482,420, Cl. 156-392.000.

Shindo, Yasushi, to Tomy Kogyo Co., Inc. Teaching toy. 4,482,329, Cl. 434-342.000.

Shinoki, Mikio: *See*—
Yamazaki, Norio; Takaoka, Naoyoshi; Shinoki, Mikio; and Huruichi, Ryonosuke, 4,482,362, Cl. 55-62.000.

Shinozaki, Fumiaki: *See*—
Namiki, Tomizo; Tago, Tomohisa; Totsuka, Mikio; and Shinozaki, Fumiaki, 4,482,625, Cl. 430-143.000.

Shinozaki, Masatoshi: *See*—
Matsumoto, Yoshihiro; Shinozaki, Masatoshi; and Irie, Toshio, 4,482,600, Cl. 428-213.000.

Shinozaki, Takashi: *See*—
Matsuda, Minoru; Shinozaki, Takashi; and Kato, Kentaro, 4,482,024, Cl. 180-219.000.

Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, to Kawasaki Steel Corporation; and Denka Consultant & Engineering Co., Ltd. Method and apparatus for distributing powdered particles. 4,482,275, Cl. 406-12.000.

Shintani, Kenji: *See*—
Tsurushima, Katsuaki; and Shintani, Kenji, 4,482,988, Cl. 369-45.000.

Shinto Kogio Ltd.: *See*—
Nishikawa, Kazuyuki; Hirao, Katsumi; Mizuguchi, Kazuhiko; and Suzuki, Hiroshi, 4,482,654, Cl. 523-145.000.

Shiomi, Shoji: *See*—
Ishitani, Kenichiro; Hamasaki, Toshiharu; Shiomi, Shoji; and Kawamura, Eiichi, 4,482,158, Cl. 277-3.000.

Shiozawa, Kazuo; and Isoguchi, Seiichi, to Shiozawa, Kazuo. Film feeding method. 4,482,227, Cl. 354-173.110.

Shipley Company Inc.: *See*—
Gulla, Michael; and Dutkewych, Oleh B., 4,482,596, Cl. 428-131.000.

Shira, Jerry P.: *See*—
Miutel, Alexander; and Shira, Jerry P., 4,482,649, Cl. 521-86.000.

Shiramizu, Kousuke; Awano, Yoshiro; Takeyama, Hiroyuki; Sakakibara, Kenji; Okada, Hiroji; and Yamagami, Hiromu, to Osaka Transformer Co., Ltd.; and Toyota Jidosha Kabushiki. Electrode biasing welding torch. 4,482,797, Cl. 219-137.610.

Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, to Kowa Company, Ltd. Aromatic aminoethanol compounds, and utilization thereof as cardiovascular agents. 4,482,562, Cl. 424-263.000.

Shiroi, Takashi: *See*—
Torii, Sigeru; Tanaka, Hideo; and Shiroi, Takashi, 4,482,435, Cl. 209-73.00R.
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; Shiroi, Takashi; and Tanaka, Akira, 4,482,491, Cl. 260-245.400.

Shiver, Carolyn, to Newpark Waste Treatment Systems Inc. Continuous process for the reclamation of waste drilling fluids. 4,482,459, Cl. 210-639.000.

Shortridge, Ernest R. Manifold apparatus for airflow sensing equipment. 4,481,829, Cl. 73-861.660.

Shuzo, Fujii: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.

Siddiqi, M. Sultan, to Miles Laboratories, Inc. Process for sealing reagent ribbons. 4,482,583, Cl. 427-284.000.

Sieglen, Rolf: *See*—
Koenig, Rainer; Sieglen, Rolf; Weisser, Wolfgang; and Heide, Helga, 4,482,864, Cl. 324-226.000.

Siemens Aktiengesellschaft: *See*—
Bayer, Eberhard, 4,482,619, Cl. 430-84.000.
Binz, Reiner; Knorpp, Eberhard; and von Sichart, Frithjof, 4,482,995, Cl. 370-59.000.
Grewal, Virinder; and Reindl, Werner, 4,482,209, Cl. 350-642.000.
Hain, Josef; and Landgraf, Hermann, 4,482,322, Cl. 433-88.000.
Quella, Ferdinand; and Schmidt, Hans-Friedrich, 4,482,683, Cl. 525-537.000.
Stadler, Heinz; and Heinzl, Alfred, 4,482,876, Cl. 335-83.000.
Wohlgemuth, Jurgen, 4,482,324, Cl. 433-215.000.

Siemens-Allis, Inc.: *See*—
Farag, Samir F.; and Kleinecke, John D., 4,482,892, Cl. 340-654.000.

Signode Corporation: *See*—
Gurak, Ronald W., 4,482,421, Cl. 156-580.100.

Sigri Elektrographit GmbH: *See*—
Giese, Hans-Joachim; Heiker, Walter R.; and Krohe, Wilfried, 4,482,314, Cl. 432-11.000.

Sikander, Ake; Bjorkman, Ake; and Jonsson, Gunther, to Lumalampan Aktiebolag. Method and apparatus for afterburning flue gases. 4,481,889, Cl. 110-212.000.

Simmonds, Robin G., to Lilly Industries Limited. Compounds and hapten-immunoglobulin conjugates derived from them. 4,482,484, Cl. 260-112.00B.

Simmons, Steven J. Combination scraper and keycase. 4,481,690, Cl. 15-236.00R.

Simon, Edgar: *See*—
Ettlinger, Manfred; Ferch, Horst; Koth, Detlev; and Simon, Edgar, 4,482,642, Cl. 502-232.000.

Singer Company, The: *See*—
Hicks, Irwin A., 4,481,812, Cl. 73-253.000.
Odermann, Charles R.; and Larsen, Robert H., 4,481,897, Cl. 112-279.000.

Siska, Thomas J.; and Obermeyer, James H., to UNR Industries, Inc. Retarder device for moving objects. 4,482,042, Cl. 193-35.00A.

Skerlos, Peter C.: *See*—
Zato, Thomas J.; and Skerlos, Peter C., 4,482,947, Cl. 364-138.000.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; and Hans, Rudiger, 4,482,040, Cl. 192-88.00A.
Walter, Lothar; Brandentein, Manfred; Ernst, Horst M.; and Olschewski, Armin, 4,482,338, Cl. 464-167.000.

Skopkova, Jana: *See*—
Brtnik, Frantisek; Barth, Tomislav; Hrbas, Pavel; Jost, Karel; Krejci, Ivan; Kupkova, Bela; Machova, Alena; Servitova, Linda; and Skopkova, Jana, 4,482,486, Cl. 260-112.50R.

Slechta, Leo J., Jr., to Sperry Corporation. Variable speed cycle time for synchronous machines. 4,482,983, Cl. 364-900.000.

Smart, Donald V., to Teradyne, Inc. Affecting laser beam pulse width. 4,483,005, Cl. 372-25.000.

Smedley, Dennis; and Spare, Noel C., to Magnesium Castings Limited. Hot chamber die-casting. 4,482,001, Cl. 164-113.000.

Smith, David W., to National Distillers and Chemical Corporation. Manufacture of oxygenated compounds. 4,482,647, Cl. 518-701.000.

Smith, Donald J.: *See*—
Beck, John L.; Bornhorst, Randy J.; Smith, Donald J.; and Zell, Michael N., 4,482,929, Cl. 360-133.000.

Smith, Fritz A.: *See*—
Chu, Yung F.; Smith, Fritz A.; and Chester, Arthur W., 4,482,773, Cl. 585-481.000.

Smith, G. D. Trailer for transporting living fowl. 4,481,870, Cl. 98-6.000.

Smith, Irl W., Jr.; and Dorschner, Terry A., to Raytheon Company. Electromagnetic wave ring resonator. 4,482,249, Cl. 356-350.000.

Smith, Jack E.; and Thomas, David G., to United States of America, Energy. Apparatus for measuring fluid flow. 4,481,830, Cl. 73-861.710.

Smith Kline & French Laboratories Limited: *See*—
Roantree, Michael L.; and Young, Rodney C., 4,482,563, Cl. 424-267.000.

Smith, Lawrence A., Jr., to Chemical Research & Licensing Company. Isomerization of C_4 alkenes. 4,482,775, Cl. 585-671.000.

Smith, Patricia J.: *See*—
Groom, Jay L., Jr.; Smith, Patricia J.; and Vair, Gary G., 4,483,002, Cl. 371-29.000.

Smith, Peter, to Spic International Limited. Insulating material. 4,482,597, Cl. 428-166.000.

Smith, Peter R.: *See*—
Auston, David H.; and Smith, Peter R., 4,482,863, Cl. 324-158.00T.

Smith, Richard R.; and Kern, Charles L., Jr., to Goodyear Tire & Rubber Company, The. Multi-layer polyisophthalate and polyterephthalate articles and process therefor. 4,482,586, Cl. 428-35.000.

Smith, Roger L.: *See*—
Wagner, Ovner R., Jr.; Murphy, Robert P., Jr.; Dauben, Dwight L.; and Smith, Roger L., 4,482,806, Cl. 250-260.000.

SmithKline Beckman Corporation: *See*—
Ladd, David L.; and Weinstock, Joseph, 4,482,572, Cl. 424-319.000.
Smits, Johan G.; de Weerd, Johan A.; and Vuyk, Cor K., to Nemaco Trading Limited. Ceiling and coupling element for the same. 4,481,745, Cl. 52-220.000.
Snook, Stephen R. Solar canopy and solar augmented wind power station. 4,481,774, Cl. 60-641.140.
Snowman, Roger O.: *See*—
Redman, Howard E.; and Snowman, Roger O., 4,482,044, Cl. 198-388.000.
Sobol, Lawrence M.: *See*—
Dziedzic, Leo M.; Idelman, Lloyd B.; and Sobol, Lawrence M., 4,482,023, Cl. 180-89.170.
Sobue, Norio: *See*—
Miki, Nobuaki; Sobue, Norio; and Yokoyama, Shoji, 4,482,339, Cl. 474-28.000.
Socapex: *See*—
Dousset, Rene , 4,482,201, Cl. 350-96.200.
Societe Anonyme: Aussedat-Rey: *See*—
Riou, Claude R.; and Fayard, Jean F., 4,482,378, Cl. 106-14.500.
Societe Cassanelli & Cie: *See*—
Rodriguez, Jose ; and Cassanelli, Robert, 4,481,861, Cl. 89-41.00A.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Ackermann, Horst W.; and Guays, Jean-Pierre, 4,482,047, Cl. 206-219.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Le Touche, Roger, 4,482,111, Cl. 244-117.00A.
Soden, Philip H.; and Vincett, Paul S., to Xerox Corporation. Multi-stage deposition process. 4,482,622, Cl. 430-135.000.
Sole, Gary M. Medical instrument, and methods of constructing and utilizing same. 4,481,948, Cl. 128-303.140.
Solvay & Cie: *See*—
Indeherbergh, Jean; and Nicolas, Edgard, 4,482,441, Cl. 204-128.000.
Somekh, George S., to Union Carbide Corporation. Separation of alkanols from aqueous reaction solutions. 4,482,768, Cl. 568-918.000.
Sonoda, Masakazu; Terajima, Takashi; and Ozawa, Minoru, to Sony Corporation. Control circuit for DC capstan motor. 4,482,850, Cl. 318-606.000.
Sony Corporation: *See*—
Fujii, Makoto; Ikuzawa, Akira; and Sullivan, Edward C., 4,482,579, Cl. 427-64.000.
Mizuguchi, Jin; Sumi, Koichiro; Muchi, Tsuneo; and Soyama, Shinichi, 4,482,447, Cl. 204-181.00N.
Moriya, Ryusuke; Eguchi, Takeo; and Ohba, Takeo, 4,482,928, Cl. 360-77.000.
Nishiyama, Kazuo; Yanada, Tetsunosuke; and Arai, Michio, 4,482,393, Cl. 148-1.500.
Noda, Toyokazu; and Ohki, Hiroshi, 4,482,986, Cl. 369-44.000.
Saito, Kenzo, 4,482,104, Cl. 242-198.000.
Sonoda, Masakazu; Terajima, Takashi; and Ozawa, Minoru, 4,482,850, Cl. 318-606.000.
Tsurushima, Katsuaki; and Shintani, Kenji, 4,482,988, Cl. 369-45.000.
Sorrentino, Cecelia M.; Pellet, Regis J.; and Bertolacini, Ralph J., to Standard Oil Company (Indiana). Reforming with a catalyst containing a Group VIII noble metal, a Group VIII non-noble metal, and gallium on separate support particles. 4,482,449, Cl. 208-139.000.
Southby, David T.: *See*—
Twist, Peter J.; Bailey, Joseph; Briggs, Stuart P.; Mijovic, Miroslav V.; and Southby, David T., 4,482,626, Cl. 430-380.000.
Southwick, Everett W.: *See*—
Williams, David L.; Southwick, Everett W.; and Houminer, Yoram, 4,481,957, Cl. 131-278.000.
Soyama, Shinichi: *See*—
Mizuguchi, Jin; Sumi, Koichiro; Muchi, Tsuneo; and Soyama, Shinichi, 4,482,447, Cl. 204-181.00N.
Span-America Medical Systems, Inc.: *See*—
Spann, Donald C., 4,482,138, Cl. 269-328.000.
Spann, Donald C., to Span-America Medical Systems, Inc. Body positioner. 4,482,138, Cl. 269-328.000.
Spare, Noel C.: *See*—
Smedley, Dennis; and Spare, Noel C., 4,482,001, Cl. 164-113.000.
Spata, Paul: *See*—
Koch, Raimund; and Spata, Paul, 4,482,223, Cl. 353-5.000.
Spencer, Arthur T.: *See*—
Brown, George L.; de Sorgo, Miksa; and Spencer, Arthur T., 4,482,673, Cl. 525-119.000.
Spencer, John D. Robust electronic liquid level gauge. 4,482,891, Cl. 340-620.000.
Sperry Corporation: *See*—
Melbye, Hartvig E.; and Jacoby, George V., 4,482,927, Cl. 360-40.000.
Slechta, Leo J., Jr., 4,482,983, Cl. 364-900.000.
Spic International Limited: *See*—
Smith, Peter, 4,482,597, Cl. 428-166.000.
Spiller, Andrew: *See*—
Airey, Anthony C.; and Spiller, Andrew, 4,482,390, Cl. 106-308.00B.
Spingath, Gerhard: *See*—
Haberhauer, Helmuth; and Spingath, Gerhard, 4,481,903, Cl. 118-653.000.
Spitz, Rodney D.; and Valk, Donald R., to Cordova Chemical Company of Michigan. Solid polyamine-based fluid loss control additives. 4,482,381, Cl. 106-90.000.
Sprague, Robert A.; and Turner, William D., to Xerox Corporation. Mechanical interface for proximity coupled electro-optic devices. 4,482,215, Cl. 350-356.000.
Spraker, Philip W. Microbiological process for removing oleaginous material from wastewater and microbiological combination capable of same. 4,482,632, Cl. 435-253.000.
Staar S. A.: *See*—
Agostini, Louis P., 4,482,993, Cl. 369-263.000.
Stadler, Heinz; and Heinzl, Alfred, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,482,876, Cl. 335-83.000.
Stadler, Reinhard, to Gesepa Anstalt Fur Patentverwertung. Cap closure including pierceable sealing element. 4,482,069, Cl. 215-249.000.
Stahle, Werner: *See*—
Biber, Wolfgang; Stahle, Werner; and Stolz, Albert, 4,482,092, Cl. 237-12.30B.
Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Wrapped yarn spinning machine. 4,481,760, Cl. 57-18.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,481,760, Cl. 57-18.000.
Staley, Richard A.: *See*—
Bowman, Jeffery B.; Hubis, Daniel E.; Lewis, James D.; Newman, Stephen C.; and Staley, Richard A., 4,482,516, Cl. 264-127.000.
Standard Oil Company, The: *See*—
Desmond, Michael J.; Benton, Kenneth C.; and Weinert, Raymond J., 4,482,639, Cl. 502-117.000.
Wagner, Ovner R., Jr.; Murphy, Robert P., Jr.; Dauben, Dwight L.; and Smith, Roger L., 4,482,806, Cl. 250-260.000.
Standard Oil Company (Indiana): *See*—
Cabanaw, Boyd E., 4,482,532, Cl. 423-574.00R.
Connolly, John F.; and Thrash, Robert J., 4,482,616, Cl. 429-101.000.
Sorrentino, Cecelia M.; Pellet, Regis J.; and Bertolacini, Ralph J., 4,482,449, Cl. 208-139.000.
Udovich, Carl A.; and Eryman, William S., 4,482,726, Cl. 549-260.000.
Wennerberg, Arnold N., 4,482,641, Cl. 502-182.000.
Star Sales Company, Inc.: *See*—
Phelps, Paul S., 4,481,712, Cl. 30-151.000.
Stark, Terrence L., to General Motors Corporation. Diesel exhaust cleaner and burner system with flame distributor. 4,481,767, Cl. 60-303.000.
Stauffer Chemical Company: *See*—
Felix, Raymond A., 4,482,504, Cl. 260-502.50F.
Javdani, Kambiz; and Welch, William J., 4,482,751, Cl. 568-626.000.
Lee, Chang R., 4,482,574, Cl. 426-7.000.
Lee, David L., 4,482,727, Cl. 549-291.000.
Stavlo, Lars G., to AGA AB. Pallet for pressurized gas cylinders. 4,481,972, Cl. 137-376.000.
Steel Heddle Manufacturing Co.: *See*—
Stenhouse, William L., 4,481,980, Cl. 139-192.000.
Stehlin, George D., Jr. Loudspeaker enclosure. 4,482,026, Cl. 181-152.000.
Steiner, Larry E., to Rowe International, Inc. Control circuit for bill and coin changer. 4,482,058, Cl. 209-534.000.
Steingraber, Gary C.; and Mullen, Terrence J., to DEC International, Inc. Valve for use in a suction line. 4,481,906, Cl. 119-14.320.
Stelrad Group Limited: *See*—
Cheetham, Harry A., 4,482,313, Cl. 431-89.000.
Stendel, Wilhelm: *See*—
Fuchs, Rainer; and Stendel, Wilhelm, 4,482,731, Cl. 560-08.000.
Stenhouse, William L., to Steel Heddle Manufacturing Co. Double dent lightweight reed construction. 4,481,980, Cl. 139-192.000.
Stephen, John F.: *See*—
Kruse, Walter M.; and Stephen, John F., 4,482,755, Cl. 568-730.000.
Stephens, Walter R.: *See*—
Berstein, Patricio; and Stephens, Walter R., 4,482,964, Cl. 364-465.000.
Stephens, William D.; and Nieder, Erin G., to United States of America, Air Force. Propellant plasticizer. 4,482,406, Cl. 149-19.400.
Stephens, William D.; and Rodman, Brenda K., to United States of America, Air Force. Plasticizer system for propellant compositions. 4,482,407, Cl. 149-19.400.
Stephens, William D.; and Rodman, Brenda K., to United States of America, Air Force. Plasticizer system for propellant compositions. 4,482,408, Cl. 149-19.400.
Stephens, William D.; and Rodman, Brenda K., to United States of America, Air Force. Plasticizer system for propellant compositions. 4,482,409, Cl. 149-19.400.
Stephens, William D.; and Jones, Linda E., to United States of America, Air Force. Plasticizer system for propellant compositions. 4,482,410, Cl. 149-19.400.
Stephens, William D.; and Jones, Linda E., to United States of America, Air Force. Plasticizer system for propellant compositions. 4,482,411, Cl. 149-19.400.
Stephenson, Douglas D. Friction furnace. 4,481,934, Cl. 126-247.000.
Sterimatic Holdings Limited: *See*—
Dent, Hugh R., 4,482,348, Cl. 604-198.000.
Sterling Drug Inc.: *See*—
Lewis, Frederick M., 4,481,890, Cl. 110-225.000.
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,482,495, Cl. 260-402.500.
Stevens, Wallace G., to Caterpillar Tractor Co. Multiple speed gear transmission. 4,481,837, Cl. 74-342.000.

Stevenson, Ernest W.; and Nahas, Randall E., to Levitator, Inc. Boat lift. 4,482,268, Cl. 405-3.000.

Stewart, Robert T., Jr., to Genicom Corporation. Variable-width friction-feed paper handling apparatus. 4,482,148, Cl. 271-273.000.

Stirling Thermal Motors, Inc.: *See*—
Meijer, Roelf J.; and Ziph, Benjamin, 4,481,771, Cl. 60-517.000.

Stirling, Wilson M. Panelling clip and method. 4,481,749, Cl. 52-714.000.

Stobb, Inc.: *See*—
Moser, James R., 4,482,141, Cl. 270-54.000.

Stock, Dieter: *See*—
Van Basshuysen, Richard; and Stock, Dieter, 4,481,807, Cl. 73-35.000.

Stohler, Harro: *See*—
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,482,739, Cl. 564-54.000.

Stojek, Dieter: *See*—
Stwiorok, Andreas; Stojek, Dieter; Blauhut, Reinhold; Brandner, Burkhard; and Knuefelmann, Manfred, 4,481,912, Cl. 123-90.150.

Stolz, Albert: *See*—
Biber, Wolfgang; Stahle, Werner; and Stolz, Albert, 4,482,092, Cl. 237-12.30B.

Stolz, James B.: *See*—
Evans, Barton, Jr.; and Stolz, James B., 4,482,967, Cl. 364-499.000.

Stone, Alan M., to Bechtel International Corporation. Rotary apparatus having improved drive means. 4,482,097, Cl. 241-101.200.

Stone, Barry N.: *See*—
Keyes, Gary S.; Riederer, Stephen J.; Lambert, Thomas W.; and Stone, Barry N., 4,482,918, Cl. 358-111.000.

Stonner, Hans-Martin, to Metallgesellschaft Aktiengesellschaft. Production of fatty alcohol with recovery thereof from the hydrogenation catalyst. 4,482,766, Cl. 568-885.000.

Stonner, Helmut: *See*—
Brobeck, Helmut; Ludewig, Hartmut; Miribel, Wolfgang; and Stonner, Helmut, 4,482,304, Cl. 417-407.000.

Stora Kopparbergs Bergslags AB: *See*—
Qvarnstrom, Bengt G. L., 4,481,893, Cl. 111-2.000.

Storage Technology Partners: *See*—
Cooke, Larry, 4,482,810, Cl. 250-492.200.

Storm, Stig, to Dynapac Maskin AB. Device for continuous adjustment of the vibration amplitude of eccentric elements. 4,481,835, Cl. 74-61.000.

Stotz, Manfred; and Scheurenbrand, Dieter, to Daimler-Benz Aktiengesellschaft. Fuel tank in particular a plastic fuel tank. 4,482,075, Cl. 220-86.00R.

Stousland, Olay, to Burlington Industries, Inc. Fine gauge cut pile tufted velvet. 4,482,594, Cl. 428-92.000.

Stowe, David W.; and Kopera, Paul M., to Gould Inc. Adjustable coupling device for a fiber-optic power divider. 4,482,203, Cl. 350-96.150.

Strader, Don S., to Motor Wheel Corporation. Tire and rim combination with safety insert. 4,481,997, Cl. 152-401.000.

Strandberg, Stanley L.; and Bloch, Jerome F. Device for operating a pull cord. 4,481,998, Cl. 160-344.000.

Strasser, Rudolf: *See*—
Schmidhammer, Ludwig; and Strasser, Rudolf, 4,482,770, Cl. 570-219.000.

Straub, Steffen: *See*—
Beck, Siegfried; Holfelder, Jurgen; Straub, Steffen; and Schnaker, Aloys, 4,482,191, Cl. 303-52.000.

Streitberger, Hans-Joachim; Lessmeister, Peter; and Zdahl, Norbert, to BASF Farben & Fasern A.G. Article and method of electrodeposition of aqueous dispersions with finely-divided, non-ionic plastics. 4,482,446, Cl. 204-181.00C.

Strickler, Rainer, to BASF Aktiengesellschaft. Quaternary ammonium salts and their preparation. 4,482,713, Cl. 544-177.000.

Stringfellow, Martin S., to Motorola Inc. Wideband VCO including variable capacitive output coupling varactor for constant power output. 4,482,871, Cl. 331-101.000.

Strobel, Klaus: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,482,515, Cl. 264-102.000.

Strohbeen, John. Compensation network for loudspeakers. 4,483,015, Cl. 381-103.000.

Strom, Robert M., to Dow Chemical Company, The. Oxidation of biphenols. 4,482,754, Cl. 568-730.000.

Stromberg-Carlson: *See*—
Brightman, Barrie; Niertit, Frank; and Hartman, Joseph A., 4,482,817, Cl. 307-257.000.

Stubberfield, Pamela M.: *See*—
Washington, Derek; King, Hewson N. G.; and Stubberfield, Pamela M., 4,482,836, Cl. 313-104.000.

Stubblefield, Jerry D., to Pensa, Inc. Shoe sole construction. 4,481,727, Cl. 36-83.000.

Stubbs, David A.: *See*—
Bar-Cohen, Yoseph; Stubbs, David A.; and Hoppe, Wally C., 4,482,835, Cl. 310-327.000.

Stuckmann, Dieter: *See*—
Unger, Eberhart; Stuckmann, Dieter; and Hein, Jurgen, 4,482,270, Cl. 405-145.000.

Studer, Rolf O.: *See*—
Bunce, Roger A.; and Studer, Rolf O., 4,482,521, Cl. 422-102.000.

Stump, Lee E., to Timesavers, Inc. Fluid cylinder with motion buffered ram assembly. 4,481,868, Cl. 92-9.000.

Stumpp, Gerhard: *See*—
Hafner, Martin; Hofmann, Karl; Schlagenhauf, Josef; Stumpp, Gerhard; and Trachte, Dietrich, 4,482,093, Cl. 239-73.000.

Stupak, Elliot: *See*—
Sandweiss, Varda E.; Stupak, Elliot; and Shapiro, Paul H., 4,482,539, Cl. 424-81.000.

Stutz, William H. Film viewer and analyzer and method. 4,482,222, Cl. 352-39.000.

Stwiorok, Andreas; Stojek, Dieter; Blauhut, Reinhold; Brandner, Burkhard; and Knuefelmann, Manfred, to Atlas Fahrzeugtechnik GmbH, Firma. Device for camshaft control. 4,481,912, Cl. 123-90.150.

Sugar, Andras; and Fabry, Laszlo. Cosmetic preparation for teeth. 4,482,535, Cl. 424-49.000.

Sugawara, Toru: *See*—
Amano, Matsuo; Sugawara, Toru; Furuhashi, Toshio; and Imai, Masumi, 4,482,962, Cl. 364-431.110.

Sugawara, Toshiyuki: *See*—
Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, 4,482,636, Cl. 436-518.000.

Sugie, Syuichi, to Kabushiki Kaisha Isshin Kenkyusho; and Tokyo Magnet Ohyo Seihin Kabushiki Kaisha. Locking devices. 4,482,175, Cl. 292-45.000.

Sugimoto, Kenichi: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; and Tanabe, Yoshimitsu, 4,482,742, Cl. 564-412.000.

Sugimoto, Makoto: *See*—
Sakai, Masao; Suzuki, Yasuhiko; and Sugimoto, Makoto, 4,482,475, Cl. 252-506.000.

Sugimoto, Tadao: *See*—
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, 4,482,627, Cl. 430-410.000.

Sugita, Hiroshi: *See*—
Nakagawa, Satoshi; Sugita, Hiroshi; Kida, Shuzi; Uemura, Morito; and Kishi, Ken-ichi, 4,482,629, Cl. 430-542.000.

Sugito, Hiroshi; and Kasuya, Tamotsu, to Kabushiki Kaisha Komatsu Seisakusho. Turbo-supercharging system for internal combustion engines. 4,481,773, Cl. 60-606.000.

Sugiura, Yasuyuki, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Intake port structure for internal combustion engines. 4,481,922, Cl. 123-306.000.

Sugiura, Yoji, to Canon Kabushiki Kaisha. Film auto loading mechanism for camera. 4,482,229, Cl. 354-212.000.

Sugiyama, Hiroyuki; and Abe, Ryozo, to Victor Company of Japan, Ltd. Quick-motion reproducing system in a rotary recording medium reproducing apparatus. 4,482,925, Cl. 358-342.000.

Sugiyama, Shinichi: *See*—
Takimoto, Toshiyuki; Aoki, Keiji; and Sugiyama, Shinichi, 4,481,928, Cl. 123-492.000.

Sullivan, Edward C.: *See*—
Fujii, Makoto; Ikuzawa, Akira; and Sullivan, Edward C., 4,482,579, Cl. 427-64.000.

Sulzer Brothers, Ltd.: *See*—
Mattes, Dieter, 4,481,790, Cl. 62-238.600.

Sumi, Koichiro: *See*—
Mizuguchi, Jin; Sumi, Koichiro; Muchi, Tsuneo; and Soyama, Shinichi, 4,482,447, Cl. 204-181.00N.

Sumitomo Chemical Company, Limited: *See*—
Furukawa, Hiroshi; Saito, Yuichi; Imai, Akio; Yoshida, Nobuyuki; and Okamoto, Yasushi, 4,482,678, Cl. 525-236.000.
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,482,501, Cl. 260-458.00C.
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,482,573, Cl. 424-327.000.
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,482,546, Cl. 424-211.000.
Tokieda, Takemi; and Abeta, Sadaharu, 4,482,350, Cl. 8-524.000.

Sumitomo Metal Industries, Limited: *See*—
Shigeta, Masatomo; Isii, Yosio; and Hoshi, Akio, 4,482,452, Cl. 208-177.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Furukawa, Hiroshi; Saito, Yuichi; Imai, Akio; Yoshida, Nobuyuki; and Okamoto, Yasushi, 4,482,678, Cl. 525-236.000.

Summagraphics Corporation: *See*—
Whetstone, Albert L., 4,482,784, Cl. 178-19.000.

Sun Tech, Inc.: *See*—
Hsu, Chao-Yang; and Lyons, James E., 4,482,756, Cl. 568-772.000.

Sundstrand Corporation: *See*—
Baldwin, Jeffrey D., 4,482,827, Cl. 310-68.00D.

Sung, Rodney L.; Sweeney, William M.; and Crawford, Wheeler C., to Texaco Inc. Middle distillate hydrocarbon compositions containing thermal stability additive. 4,482,354, Cl. 44-57.000.

Sury, Francis P. Combined level and protractor with calibration features. 4,481,720, Cl. 33-451.000.

Sutton, Richard C., to Boeing Company, The. Tilt wing short takeoff aircraft and method. 4,482,108, Cl. 244-12.400.

Suzuki, Hideo: *See*—
Honda, Shunsuke; Suzuki, Hideo; and Yahata, Haruki, 4,483,009, Cl. 375-14.000.

Suzuki, Hiroshi: *See*—
Nishikawa, Kazuyuki; Hirao, Katsumi; Mizuguchi, Kazuhiko; and Suzuki, Hiroshi, 4,482,654, Cl. 523-145.000.

Suzuki, Ikuo; Unno, Kunihiko; and Ohta, Norio, to Toyoda Koki Kabushiki Kaisha. Grinding machine with dual turrets. 4,481,739, Cl. 51-5.00D.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Ishida, Tokuzi, 4,481,914, Cl. 123-179.00G.

Sugiura, Yasuyuki, 4,481,922, Cl. 123-306.000.
Suzuki, Koji; Kuroda, Kouki; and Nagahira, Jyoji, to Canon Kabushiki Kaisha. Image formation apparatus. 4,482,243, Cl. 355-14.00D.
Suzuki, Naoyoshi; Hirose, Tsuneo; and Osaki, Humio, to Otsuka Pharmaceutical Factory, Inc. Biologically active substance, process for preparing the substance and immunoactive composition. 4,482,543, Cl. 424-177.000.
Suzuki, Takeshi: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Inai, Yuichi; Suzuki, Yoshikazu; and Tagaya, Osamu, 4,482,734, Cl. 560-104.000.
Suzuki, Yasuhiko: *See*—
Sakai, Masao; Suzuki, Yasuhiko; and Sugimoto, Makoto, 4,482,475, Cl. 252-506.000.
Suzuki, Yoshikazu: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Inai, Yuichi; Suzuki, Yoshikazu; and Tagaya, Osamu, 4,482,734, Cl. 560-104.000.
Swain, Richard S.; and Fimoff, Mark, to Norlin Industries, Inc. Tone generator assignment system for an electronic musical instrument. 4,481,851, Cl. 84-1.010.
Swaney, Richard E.; and Long, William D., to Hughes Aircraft Company. Direct memory access method for use with a multiplexed data bus. 4,482,951, Cl. 364-200.000.
Sweeney, William M.: *See*—
Sung, Rodney L.; Sweeney, William M.; and Crawford, Wheeler C., 4,482,354, Cl. 44-57.000.
Swoboda, Johann: *See*—
Hambrecht, Juergen; Reffert, Rudi W.; Muench, Volker; Echte, Adolf; and Swoboda, Johann, 4,482,705, Cl. 528-486.000.
Syncom International, Inc.: *See*—
Bouley, Robert W.; and Kovar, Robert F., 4,482,590, Cl. 428-35.000.
System Homes Company, Ltd.: *See*—
Yoshino, Hozo, 4,481,788, Cl. 62-181.000.
Systems Research Laboratories, Inc.: *See*—
Bar-Cohen, Yoseph; Stubbs, David A.; and Hoppe, Wally C., 4,482,835, Cl. 310-327.000.
Szabo, Zoltan: *See*—
Pais, Istvan; Feher nee Ravasz, Magda; Nagy, Balint; Bokori, Jozsef; and Szabo, Zoltan, 4,482,550, Cl. 424-245.000.
Szasz, Gyorgy: *See*—
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,482,557, Cl. 424-251.000.
Sze, Daniel T. W.: *See*—
Janson, Philippe A.; Mueller, Hans R.; and Sze, Daniel T. W., 4,482,999, Cl. 370-86.000.
Szen, Tamas: *See*—
Boor, Anna; Toth, Jozsef; Szen, Tamas; Gabor, Laszlo; Major nee Feistner, Piroska; and Holly, Sandor, 4,482,494, Cl. 260-397.400.
Szewczuk, Thomas M.: *See*—
North, William E.; and Szewczuk, Thomas M., 4,482,295, Cl. 416-96.00A.
Tabak, Samuel A., to Mobil Oil Corporation. Multistage process for converting oxygenates to hydrocarbons. 4,482,772, Cl. 585-254.000.
Tabaru, Kazunori; Aoyama, Takafumi; and Kumakura, Toshio, to Hitachi Metals, Ltd. Preparation method of magnetic toner. 4,482,623, Cl. 430-137.000.
Tabata, Haruro: *See*—
Teranaka, Osamu; Kakutani, Tsutomu; Tabata, Haruro; and Teraoka, Tutomu, 4,482,677, Cl. 525-250.000.
Tabor, Bruce A.: *See*—
Tabor, Sam H.; and Tabor, Bruce A., 4,482,321, Cl. 433-71.000.
Tabor, Sam H.; and Tabor, Bruce A. Orthodontists bracket registration wafer. 4,482,321, Cl. 433-71.000.
Tabuchi, Shuji, to Fujitsu Limited; and Disco Abrasive Systems, Ltd. Grinding machine. 4,481,738, Cl. 51-5.00R.
Tachibana, Masataka. Fish-egg sorting apparatus. 4,482,060, Cl. 209-588.000.
Tadaaki, Iwamura: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.
Tagaya, Osamu: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Inai, Yuichi; Suzuki, Yoshikazu; and Tagaya, Osamu, 4,482,734, Cl. 560-104.000.
Tago, Tomohisa: *See*—
Namiki, Tomizo; Tago, Tomohisa; Totsuka, Mikio; and Shinozaki, Fumiaki, 4,482,625, Cl. 430-143.000.
Tait, William C.: *See*—
Rubertus, Roland W.; and Tait, William C., 4,482,874, Cl. 333-185.000.
Taiyo Sanso Co., Ltd.: *See*—
Yamazaki, Norio; Takaoka, Naoyoshi; Shinoki, Mikio; and Hurui-chi, Ryonosuke, 4,482,362, Cl. 55-62.000.
Takada, Masaki: *See*—
Sakakibara, Hideo; Satoi, Shuzo; Awata, Masashi; Sagai, Hitoshi; Hayashi, Mitsuo; Muto, Naoki; and Takada, Masaki, 4,482,707, Cl. 536-16.800.
Takada, Toshiyuki; and Yamamoto, Hitoshi, to Kawasaki Jukogyo Kabushiki Kaisha. Two-cycle internal combustion engine. 4,481,909, Cl. 123-73.0CC.
Takagi, Masashi: *See*—
Yoshimi, Akiro; Takagi, Masashi; Sakurai, Masao; and Takemi, Akio, 4,482,007, Cl. 165-21.000.
Takagi, Tadao; and Okabe, Nobuo, to Nippon Kogaku K.K. Automatic focusing device. 4,482,234, Cl. 354-402.000.
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, to Fuji Photo Film Co., Ltd. Method of treating direct positive silver halide sensitive material. 4,482,627, Cl. 430-410.000.
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, to Hitachi, Ltd. Thermosetting resin composition comprising dicyanamide and polyvalent imide. 4,482,703, Cl. 528-322.000.
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. Fungicidal N-phenylcarbamates. 4,482,546, Cl. 424-211.000.
Takahashi, Masao: *See*—
Takeuchi, Fumio; Takahashi, Masao; and Sakai, Hiroshi, 4,482,403, Cl. 149-2.000.
Takahashi, Yuu: *See*—
Sato, Mitsuo; and Takahashi, Yuu, 4,481,834, Cl. 74-44.000.
Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, to Sharp Kabushiki Kaisha. Electrode terminal assembly on a multi-layer type liquid crystal panel. 4,482,212, Cl. 350-334.000.
Takano, Toshio; and Kobayashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Automatic transmission for four wheel drive automotive vehicles. 4,481,877, Cl. 180-233.000.
Takaoka, Naoyoshi: *See*—
Yamazaki, Norio; Takaoka, Naoyoshi; Shinoki, Mikio; and Hurui-chi, Ryonosuke, 4,482,362, Cl. 55-62.000.
Takaro Co., Ltd.: *See*—
Matsuda, Takashi, 4,482,256, Cl. 368-10.000.
Takashi, Moriyama: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.
Takashima, Shigekazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic equalizer. 4,483,010, Cl. 375-14.000.
Takebe, Katsuhiko: *See*—
Makuta, Shunichi; Miyasaka, Hiroshi; and Takebe, Katsuhiko, 4,481,852, Cl. 84-1.030.
Takeda, Katunobu: *See*—
Shimizu, Keizo; Takeda, Katunobu; Furuichi, Tokinori; Oguri, Masao; and Ikoma, Junichi, 4,482,992, Cl. 369-221.000.
Takeda Machinery Works Company, Ltd.: *See*—
Ikeda, Chihiro, 4,481,848, Cl. 83-693.000.
Takegawa, Yujiro, to Tsudakomo Kogyo Kabushiki Kaisha. Weft reservoir for fluid-jet looms. 4,481,983, Cl. 139-452.000.
Takemae, Yoshihiro: *See*—
Nozaki, Shigeki; Takemae, Yoshihiro; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,482,825, Cl. 307-578.000.
Takemi, Akio: *See*—
Yoshimi, Akiro; Takagi, Masashi; Sakurai, Masao; and Takemi, Akio, 4,482,007, Cl. 165-21.000.
Takeshita, Kiyoshi: *See*—
Kurushima, Tadanori; Takeshita, Kiyoshi; and Kamiya, Kazuo, 4,481,766, Cl. 57-417.000.
Takeshita, Shigeo; and Kitamura, Yoshiaki, to Kabushiki Kaisah Kitamuragokin Seisakusho. Apparatus for rendering PCB virulence-free. 4,481,891, Cl. 110-238.000.
Takeshita, Yasuhiro: *See*—
Asahi, Satoshi; Mori, Shigeo; and Takeshita, Yasuhiro, 4,482,686, Cl. 526-119.000.
Taketomo, Eiiji; and Fujiura, Masami, to Nippon Steel Corporation. Porous materials for concentration and separation of hydrogen or helium, and process therewith for the separation of the gas. 4,482,360, Cl. 55-16.000.
Takeuchi, Fumio; Takahashi, Masao; and Sakai, Hiroshi, to Nippon Oil and Fats Company, Limited. Water-in-oil emulsion explosive composition. 4,482,403, Cl. 149-2.000.
Takeuchi, Masato: *See*—
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, 4,482,479, Cl. 252-630.000.
Takeyama, Hiroyuki: *See*—
Shiramizu, Kousuke; Awano, Yoshiro; Takeyama, Hiroyuki; Sakakibara, Kenji; Okada, Hiroji; and Yamagami, Hiromu, 4,482,797, Cl. 219-137.610.
Takigawa, Hiroyoshi; and Ogawa, Hiroshi, to Bridgestone Tire Company Limited. Heavy duty radial tire. 4,481,992, Cl. 152-209.00R.
Takimoto, Toshiyuki; Aoki, Keiji; and Sugiyama, Shinichi, to Toyota Jidosha Kabushiki Kaisha. L-Jetronic fuel injected engine control device and method smoothing air flow meter overshoot. 4,481,928, Cl. 123-492.000.
Tallman, Peter H., to International Business Machines Corporation. Parallel queueing method. 4,482,956, Cl. 364-300.000.
Tamamura, Hideo, to Canon Kabushiki Kaisha. Winding and rewinding device for camera. 4,482,226, Cl. 354-173.100.
Tamir, Hadassah; Karpiak, Stephen E.; and Wilchek, Meir, to Research Foundation for Mental Hygiene, Inc.; and Yeda Research and Development Co. Ltd. N-hexanoyl to n-heptadecanoyl 5-hydroxy tryptophan-5-hydroxytryptophanamides and use as analgesics. 4,482,567, Cl. 424-274.000.
Tanabe, Yoshiaki: *See*—
Kato, Hironobu; Ichikawa, Masaru; Sano, Atsushi; Tanabe, Yoshiaki; and Nakano, Yoshiyuki, 4,482,231, Cl. 354-246.000.
Tanabe, Yoshimitsu: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; and Tanabe, Yoshimitsu, 4,482,742, Cl. 564-412.000.

Tanaka, Akihiro: *See*—
Fujimoto, Minoru; and Tanaka, Akihiro, 4,481,824, Cl. 73-643.000.
Tanaka, Akira: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; Shiroi, Takashi; and Tanaka, Akira, 4,482,491, Cl. 260-245.400.
Tanaka, Hideo: *See*—
Torii, Sigeru; Tanaka, Hideo; and Shiroi, Takashi, 4,482,435, Cl. 209-73.00R.
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; Shiroi, Takashi; and Tanaka, Akira, 4,482,491, Cl. 260-245.400.
Tanaka, Kazuo, to Canon Kabushiki Kaisha. Zoom lens. 4,482,218, Cl. 350-427.000.
Tanaka, Kazuo: *See*—
Mano, Toru; Fukuda, Takeshi; Fukushima, Toshitaka; Ueno, Kouji; and Tanaka, Kazuo, 4,482,914, Cl. 357-68.000.
Tanaka, Shinsaku; and Arata, Tadao, to Tanashin Denki Co., Ltd. Tape driving mechanism for a tape recorder. 4,482,085, Cl. 226-187.000.
Tanaka, Teruaki: *See*—
Todaka, Seizi; and Tanaka, Teruaki, 4,482,888, Cl. 340-384.00E.
Tanashin Denki Co., Ltd.: *See*—
Tanaka, Shinsaku; and Arata, Tadao, 4,482,085, Cl. 226-187.000.
Tanei, Hirayoshi; Iwanaga, Shoichi; Ikegami, Akira; Otsu, Hiroshi; and Isonae, Hiromi, to Hitachi, Ltd. Dew sensor. 4,481,813, Cl. 73-336.500.
Tanguy, Jean: *See*—
Lorin, Andre ; Rosilio, Andre ; and Tanguy, Jean, 4,482,581, Cl. 427-79.000.
Tanigawa, Koichi: *See*—
Kuge, Tsukasa; Tanigawa, Koichi; and Adachi, Hiroyuki, 4,482,240, Cl. 355-3.0TR.
Tanikawa, Kowji: *See*—
Matsui, Kohichi; and Tanikawa, Kowji, 4,482,894, Cl. 340-756.000.
Tarasescu, Mihail; Oproiu, Margareta; Asultanei, Alexandru; Bucur, Grigore; Ceausescu, Nicu; Popovici, Constantin; Balaceanu, Mihai; and Popescu, Mihai, to Institutul De Cercetare Stiintifica, Inginerie Tehnologica Si Proiectare Pentru Sectoare Calde. Method of and apparatus for melting and casting reactive metals. 4,482,376, Cl. 75-10.00R.
Tardieu, Pierre R.; and Mulet-Marquis, Yves H., to Kollmorgen Technologies Corporation. Brushless electric micromotor. 4,482,829, Cl. 310-105.000.
Tarjan, Peter P.: *See*—
Gold, Philip; and Tarjan, Peter P., 4,481,953, Cl. 128-786.000.
Tarumoto, Kouji: *See*—
Morishita, Tuyoshi; Hattori, Toshihiko; Kawado, Yashuhumi; and Tarumoto, Kouji, 4,482,399, Cl. 148-31.500.
Tarutani, Takashi: *See*—
Ishii, Taiji; and Tarutani, Takashi, 4,482,598, Cl. 428-195.000.
Tateishi, Iwao; Mizuta, Takemi; Yokoyama, Tatuo; and Kakutani, Nobuyasu, to Sharp Kabushiki Kaisha. Taximeter with tariff display mode controlled by removable memory addressable by fare rate keys. 4,482,965, Cl. 364-467.000.
Tateno, Kenichi: *See*—
Nishikawa, Mikio; Fujii, Hiroyuki; Tateno, Kenichi; and Yokozawa, Masami, 4,482,915, Cl. 357-72.000.
Taub, Alan I., to General Electric Company. Dynamic annealing method for optimizing the magnetic properties of amorphous metals. 4,482,402, Cl. 148-121.000.
Taylor, Alwyn H.: *See*—
Turchan, Michael J., deceased; Moses, Peter R.; and Taylor, Alwyn H., 4,482,613, Cl. 429-53.000.
Taylor, David J.: *See*—
Dawson, James M.; and Taylor, David J., 4,482,165, Cl. 280-432.000.
TDK Electronics Co., Ltd.: *See*—
Okano, Tadao, 4,481,881, Cl. 101-126.000.
Technion Research and Development Foundation, Ltd.: *See*—
Meretsky, Paul L., 4,482,856, Cl. 320-59.000.
Techtransfer GmbH & Co. KG: *See*—
Roediger, Hanns, 4,482,633, Cl. 435-311.000.
Tecnomare, S.p.A.: *See*—
Brandi, Roberto; Bucaneve, Giovanni; Della Greca, Antonio; Sebastiani, Gaetano; Toffano, Francesco; and Vielmo, Paolo, 4,482,274, Cl. 405-224.000.
Teijin Limited: *See*—
Yoshida, Tsugushi; Sasaki, Hideharu; Sawaki, Toru; and Shimada, Keizo, 4,482,603, Cl. 428-287.000.
Teikoku Hormone Mfg. Co., Ltd.: *See*—
Hirai, Kentaro; Ishiba, Teruyuki; Matsutani, Shigeru; Makino, Itsuo; Fujishita, Toshio; Doeteuchi, Masami; and Otani, Koichi, 4,482,566, Cl. 424-274.000.
Tektronix, Inc.: *See*—
Jalovec, Lee J.; and Andrews, Roland E., 4,482,861, Cl. 324-77.00B.
Teledyne Industries, Inc.: *See*—
Dieser, John J., 4,481,803, Cl. 72-150.000.
Telfer, Stewart B.; Zervas, George; and Knott, Peter, to University of Leeds Industrial Services Limited. Water soluble glass articles, their manufacture, and their use in the treatment of ruminant animals. 4,482,541, Cl. 424-128.000.
Tengesdal, Paul; and Jensen, Sigbjorn. Assembly for mounting plates to a framework structure. 4,481,747, Cl. 52-460.000.
Terada, Tsutomu: *See*—
Yoshimura, Tatsushiro; Honda, Norimasa; and Terada, Tsutomu, 4,482,476, Cl. 252-511.000.
Teradyne, Inc.: *See*—
Smart, Donald V., 4,483,005, Cl. 372-25.000.
Terajima, Takashi: *See*—
Sonoda, Masakazu; Terajima, Takashi; and Ozawa, Minoru, 4,482,850, Cl. 318-606.000.
Teranaka, Osamu; Kakutani, Tsutomu; Tabata, Haruro; and Teraoka, Tutomu, to Japan Elastomer Co., Ltd. Process for producing high impact polystyrene. 4,482,677, Cl. 525-250.000.
Teraoka, Tutomu: *See*—
Teranaka, Osamu; Kakutani, Tsutomu; Tabata, Haruro; and Teraoka, Tutomu, 4,482,677, Cl. 525-250.000.
Terasaki, Masahiro. Cigarette holder with tar collecting means. 4,481,955, Cl. 131-216.000.
Terry Corporation: *See*—
Mosimann, John G.; and Wassell, Mark E., 4,482,297, Cl. 416-218.000.
Wassell, Mark E.; and Mosimann, John G., 4,482,296, Cl. 416-215.000.
Tershak, Andrew T.; and Thieneman, Michael D., to Whirlpool Corporation. Adaptive defrost control system for a refrigerator. 4,481,785, Cl. 62-153.000.
Terui, Nobuhiko: *See*—
Yasukawa, Seiichi; Terui, Nobuhiko; and Fukuhara, Toru, 4,482,235, Cl. 354-402.000.
Terunuma, Hiroshi: *See*—
Magariyama, Kenichi; Kimura, Makoto; and Terunuma, Hiroshi, 4,482,230, Cl. 354-219.000.
Teshima, Koichi; Yamada, Masakazu; Sakurai, Toshiharu; and Abe, Takemi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic parts. 4,482,611, Cl. 428-647.000.
Testa, Rodolfo: *See*—
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; and Graziani, Gabriele, 4,482,561, Cl. 424-258.000.
Texaco Inc.: *See*—
Davis, Lorne A., Jr.; Brost, Dale F.; and Haskin, Helen K., 4,482,634, Cl. 436-31.000.
Karol, Thomas J.; Schlicht, Raymond C.; and Magaha, Harold S., 4,482,464, Cl. 252-51.50A.
Sung, Rodney L.; Sweeney, William M.; and Crawford, Wheeler C., 4,482,354, Cl. 44-57.000.
Yeakey, Ernest L.; and Zimmerman, Robert L., 4,482,743, Cl. 564-477.000.
Texas Instruments Incorporated: *See*—
Darley, Henry M.; Houston, Theodore W.; and Kruger, James B., 4,481,704, Cl. 29-571.000.
Piliavin, Michael A.; Sampsell, Jeffrey B.; and Penz, Perry A., 4,482,213, Cl. 350-334.000.
Tiku, Shiban K.; and Johnson, Milo R., 4,482,841, Cl. 313-503.000.
Tezuka, Yasuo: *See*—
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,482,501, Cl. 260-458.00C.
Thieneman, Michael D.: *See*—
Tershak, Andrew T.; and Thieneman, Michael D., 4,481,785, Cl. 62-153.000.
Thomann, Christoph, to Zellweger Uster Ltd. Method of and an apparatus for measuring characteristic features of fibrous material. 4,481,820, Cl. 73-597.000.
Thomas, David G.: *See*—
Smith, Jack E.; and Thomas, David G., 4,481,830, Cl. 73-861.710.
Thomas, Edwin W.: *See*—
O'Brien, Thomas B.; and Thomas, Edwin W., 4,481,973, Cl. 137-469.000.
Thomas, Lowell E., to Dynamics Research Corporation. Optical grating and method of manufacture. 4,482,207, Cl. 350-162.200.
Thomas, Ralph H., Sr.: *See*—
Agbay, Albert J.; and Thomas, Ralph H., Sr., 4,482,068, Cl. 215-225.000.
Thomson-Brandt: *See*—
Metz, Pierre, 4,482,107, Cl. 244-3.220.
Thomson-CSF: *See*—
Jay, Paul R., 4,482,907, Cl. 357-22.000.
Lacotte, Jean-Pierre; Fichot, Bernard; and Troude, Gilles, 4,482,803, Cl. 250-201.000.
Papuchon, Michel; Puech, Claude; and Arditty, Herve , 4,482,248, Cl. 356-346.000.
Quoirin, Jean B., 4,482,911, Cl. 357-46.000.
Roche, Marcel, 4,481,706, Cl. 29-577.00C.
Thomson-Leeds Company, Inc.: *See*—
Weiller, Peter J., 4,481,729, Cl. 40-606.000.
Thorbek, Pia; Bundgaard, Hans; and Larsen, Claus, to A/S Dumex (Dumex Ltd.). Ester of metronidazole with N,N-dimethylglycine and acid addition salt thereof. 4,482,722, Cl. 548-338.000.
Thorn EMI-Varian Limited: *See*—
Perring, Dudley, 4,482,843, Cl. 315-4.000.
Thorp, Sidney: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,481,872, Cl. 99-353.000.
Thrash, Robert J.: *See*—
Connolly, John F.; and Thrash, Robert J., 4,482,616, Cl. 429-101.000.
Threlkel, Richard S., to Chevron Research Company. Process for preparation of methyl methoxyacetate. 4,482,735, Cl. 560-187.000.

Tiku, Shiban K.; and Johnson, Milo R., to Texas Instruments Incorporated. Composite dielectrics for low voltage electroluminescent displays. 4,482,841, Cl. 313-503.000.

Tilly, Thomas; and Rogers, Lloyd W., Jr., to General Motors Corporation. Anchorage for a seat mounted seat belt. 4,482,188, Cl. 297-473.000.

Timesavers, Inc.: *See—*
Stump, Lee E., 4,481,868, Cl. 92-9.000.

Ting, Vincent W.: *See—*
Woo, James T. K.; Ting, Vincent W.; and Marcinko, Richard M., 4,482,671, Cl. 525-31.000.

Tishman, Andrew. Directionally variable lighting assembly. 4,482,939, Cl. 362-64.000.

Tjugum, Odd M.: *See—*
Tjugum, Olav G.; and Tjugum, Odd M., 4,482,273, Cl. 405-222.000.

Tjugum, Olav G.; and Tjugum, Odd M. Process of casting or repairing concrete under water. 4,482,273, Cl. 405-222.000.

TMC Corporation: *See—*
Oberleitner, Gerhard, 4,482,168, Cl. 280-612.000.

Todaka, Seizi; and Tanaka, Teruaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Alarming apparatus. 4,482,888, Cl. 340-384.00E.

Toffano, Francesco: *See—*
Brandi, Roberto; Bucaneve, Giovanni; Della Greca, Antonio; Sebastiani, Gaetano; Toffano, Francesco; and Vielmo, Paolo, 4,482,274, Cl. 405-224.000.

Toffolon, Roger L. Universal multi-part form for casting concrete parapets. 4,482,126, Cl. 249-159.000.

Toho Beslon Co., Ltd.: *See—*
Minamisawa, Tsuyoshi; and Andoh, Masato, 4,482,660, Cl. 523-428.000.

Tohoku University: *See—*
Inaba, Humio; Ito, Hiromasa; and Ogawa, Yoh, 4,483,004, Cl. 372-8.000.

Tokico Ltd.: *See—*
Kaneko, Shinji, 4,482,266, Cl. 403-135.000.

Tokieda, Takemi; and Abeta, Sadaharu, to Sumitomo Chemical Company, Limited. Reactive dye composition for cellulose fiber. 4,482,350, Cl. 8-524.000.

Tokieda, Takemi: *See—*
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,482,501, Cl. 260-458.00C.

Tokita, Osamu: *See—*
Kanayama, Hisayasu; Sasaki, Yoshiaki; Furuno, Naoki; Sasaoka, Yoshitaka; and Tokita, Osamu, 4,482,382, Cl. 106-90.000.

Tokiwa Yakuhin Kogyo Kabushiki Kaisha: *See—*
Tomimatsu, Toshiaki; and Murakami, Kotaro, 4,482,706, Cl. 536-6.100.

Tokuda, Ryuji, to Canon Kabushiki Kaisha. Brightness warning device for camera. 4,482,238, Cl. 354-427.000.

Tokuda, Ryuji: *See—*
Tsuzuki, Hiroyoshi; Tokuda, Ryuji; and Matsuda, Mutsuhide, 4,482,236, Cl. 354-412.000.

Tokyo Electronic Industry Co., Ltd.: *See—*
Yoshida, Shinichi; and Kobayashi, Kazutaka, 4,482,920, Cl. 358-228.000.

Tokyo Juki Industrial Co., Ltd.: *See—*
Asao, Hideo; and Yasuda, Satoru, 4,481,895, Cl. 112-121.120.

Tokyo Magnet Ohyo Seihin Kabushiki Kaisha: *See—*
Sugie, Syuichi, 4,482,175, Cl. 292-45.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Amano, Katsumi; and Ishii, Takatoshi, 4,482,955, Cl. 364-200.000.
Honda, Shunsuke; Suzuki, Hideo; and Yahata, Haruki, 4,483,009, Cl. 375-14.000.
Horii, Tetsuo; Nara, Seietsu; and Haruki, Kazuhito, 4,482,059, Cl. 209-569.000.
Koizumi, Hideo; Koseki, Isamu; Morita, Tadashi; Yamazaki, Shu; and Fukuhara, Yoshio, 4,482,837, Cl. 378-144.000.
Nakayama, Nobutoshi; Ito, Yukinobu; Nishihara, Eitaro; Iwata, Kazuhide; and Shibayama, Shigeki, 4,482,958, Cl. 364-414.000.
Ohtake, Yasuhisa; Seino, Kazuyuki; and Kamohara, Eiji, 4,482,334, Cl. 445-47.000.
Otsuka, Kenichi; and Shimamura, Takeo, 4,482,855, Cl. 318-809.000.
Sato, Hideki, 4,483,013, Cl. 378-112.000.
Takashima, Shigekazu, 4,483,010, Cl. 375-14.000.
Teshima, Koichi; Yamada, Masakazu; Sakurai, Toshiharu; and Abe, Takemi, 4,482,611, Cl. 428-647.000.
Todaka, Seizi; and Tanaka, Teruaki, 4,482,888, Cl. 340-384.00E.

Tolkmitt, Uwe: *See—*
Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, 4,481,763, Cl. 57-81.000.

Tomforde, Johann: *See—*
Huber, Guntram; Fischer, Wolfgang; Haeberle, Fritz; Kleiner, Horst; Riechers, Daniel; Klie, Wolfgang; and Tomforde, Johann, 4,482,180, Cl. 293-120.000.

Tomimatsu, Toshiaki; and Murakami, Kotaro, to Tokiwa Yakuhin Kogyo Kabushiki Kaisha. Steroid saponins. 4,482,706, Cl. 536-6.100.

Tominaga, Hiroshi; Sase, Yoshihiro; and Horiuchi, Shoichi, to Hitachi, Ltd.; and Japan Atomic Energy Research Institute. Apparatus for measuring neutrons and gamma rays. 4,482,808, Cl. 250-392.000.

Tomita, Seisuke: *See—*
Ogawa, Masaki; Hirata, Yasushi; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,481,995, Cl. 152-356.00R.

Tomita, Yoshifumi: *See—*
Fujimura, Takashi; Tomita, Yoshifumi; and Sawatari, Kiyoshi, 4,482,842, Cl. 313-634.000.

Tomka, Ivan: *See—*
Wittwer, Fritz; and Tomka, Ivan, 4,482,386, Cl. 106-135.000.

Tomy Kogyo Co., Inc.: *See—*
Mizunuma, Masanori; and Watanabe, Hiroyuki, 4,482,154, Cl. 273-153.00S.
Shindo, Yasushi, 4,482,329, Cl. 434-342.000.

Tonsor, Andrew J.: *See—*
Boggs, Roger L.; and Tonsor, Andrew J., 4,482,193, Cl. 305-51.000.

Toomey, Joseph E., Jr., to Reilly Tar & Chemical Corp. Electrochemical reductions of cyanopyridine bases. 4,482,437, Cl. 204-74.000.

Toomey, Joseph E., Jr., to Reilly Tar & Chemical Corp. Electrochemical oxidation of pyridine bases. 4,482,439, Cl. 204-78.000.

Top Roc Precast Corporation: *See—*
Morgan, Burton D., 4,482,269, Cl. 405-29.000.

Toppan Printing Co., Ltd.: *See—*
Ohodaira, Takeo; and Mizutani, Takashi, 4,482,585, Cl. 428-35.000.

Topre Corporation: *See—*
Hasegawa, Hiroshi, 4,482,932, Cl. 361-288.000.

Toray Industries, Inc.: *See—*
Kashiwagi, Michio, 4,482,621, Cl. 430-107.000.

Torii, Sigeru; Tanaka, Hideo; and Shiroi, Takashi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing thiazolidine compounds. 4,482,435, Cl. 209-73.00R.

Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; Shiroi, Takashi; and Tanaka, Akira, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Thiazolinoazetidinone derivatives and process for the preparation of the same. 4,482,491, Cl. 260-245.400.

Torke, Renate: *See—*
Engelsmann, Dieter; Hackenberg, Hubert; and Torke, Renate, 4,482,232, Cl. 354-275.000.

Torsiflex Limited: *See—*
Goody, Edward W., 4,482,335, Cl. 464-94.000.

Toseland, Bernard A.; and Van Court Carr, Richard, to Air Products and Chemicals, Inc. Reducing 2,4-dinitroortho-cresol in effluent stream from dinitrotoluene process. 4,482,769, Cl. 568-934.000.

Toth, Jozsef: *See—*
Boor, Anna; Toth, Jozsef; Szen, Tamas; Gabor, Laszlo; Major nee Feistner, Piroska; and Holly, Sandor, 4,482,494, Cl. 260-397.400.

Totsuka, Mikio: *See—*
Namiki, Tomizo; Tago, Tomohisa; Totsuka, Mikio; and Shinozaki, Fumiaki, 4,482,625, Cl. 430-143.000.

Towae, Friedrich: *See—*
Merger, Franz; Nestler, Gerhard; Platz, Rolf; Towae, Friedrich; and Hellbach, Hans, 4,482,499, Cl. 260-453.00P.

Towgood, Dennis A.: *See—*
Friedericy, Johan A.; and Towgood, Dennis A., 4,481,840, Cl. 74-572.000.

Toyo Jozo Kabushiki Kaisha: *See—*
Sakakibara, Hideo; Satoi, Shuzo; Awata, Masashi; Sagai, Hitoshi; Hayashi, Mitsuo; Muto, Naoki; and Takada, Masaki, 4,482,707, Cl. 536-16.800.

Toyo Kogyo Co., Ltd.: *See—*
Morishita, Tuyoshi; Hattori, Toshihiko; Kawado, Yashuhumi; and Tarumoto, Kouji, 4,482,399, Cl. 148-31.500.

Toyo Tire & Rubber Co., Ltd.: *See—*
Ohnishi, Sumio, 4,481,993, Cl. 152-209.00B.

Toyoda Koki Kabushiki Kaisha: *See—*
Suzuki, Ikuo; Unno, Kunihiko; and Ohta, Norio, 4,481,739, Cl. 51-5.00D.

Toyosato, Kaku, to M.G.I. Co., Ltd. Bulb peeling apparatus. 4,481,875, Cl. 99-584.000.

Toyota Jidosha Kabushiki: *See—*
Shiramizu, Kousuke; Awano, Yoshiro; Takeyama, Hiroyuki; Sakakibara, Kenji; Okada, Hiroji; and Yamagami, Hiromu, 4,482,797, Cl. 219-137.610.

Toyota Jidosha Kabushiki Kaisha: *See—*
Hori, Shinichi; Ohnishi, Yasuichi; Ono, Makoto; Ueda, Masahiro; and Noba, Masahiko, 4,482,812, Cl. 290-38.00R.
Kobayashi, Tatsuo, 4,481,924, Cl. 123-425.000.
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,915, Cl. 123-188.00M.
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,481,916, Cl. 123-188.00M.
Takimoto, Toshiyuki; Aoki, Keiji; and Sugiyama, Shinichi, 4,481,928, Cl. 123-492.000.

Toyota Jidosha Kobushiki Kaisha: *See—*
Onaka, Hidemi; and Yoshioka, Mamoru, 4,482,508, Cl. 261-39.00A.

Trachte, Dietrich: *See—*
Hafner, Martin; Hofmann, Karl; Schlagenhauf, Josef; Stumpp, Gerhard; and Trachte, Dietrich, 4,482,093, Cl. 239-73.000.

Tri-tech, Inc.: *See—*
Geremia, Leo, 4,482,792, Cl. 200-302.300.

Trimble, Donald E.: *See—*
Bailey, David C.; Burberry, Lee M.; Trimble, Donald E.; Bardos, Andrew M.; and Perry, Philip M., 4,482,902, Cl. 346-108.000.

Trinh, Toan: *See—*
Sagel, Paul J.; and Trinh, Toan, 4,482,593, Cl. 428-90.000.

Trissler, Hans D.: *See—*
Goller, Ernst; Kazmaier, Gunther; and Trissler, Hans D., 4,481,795, Cl. 66-150.000.

Triumph Motorcycles (Meriden) Limited: *See—*
Morton, Paul G., 4,481,918, Cl. 123-192.00B.

Trojan Technologies Inc.: *See—*
Maarschalkerweerd, Jan M., 4,482,809, Cl. 250-436.000.

Trotz, Samuel I.; and Farmer, Douglas A., Jr., to Olin Corporation. Process for the prevention or reduction of discoloration of sodium or zinc pyrithione. 4,482,715, Cl. 546-6.000.
Troude, Gilles: *See*—
Lacotte, Jean-Pierre; Fichot, Bernard; and Troude, Gilles, 4,482,803, Cl. 250-201.000.
Trudeau, Marcel: *See*—
Corbeil, Romain; Faubert, Jacques; and Trudeau, Marcel, 4,482,123, Cl. 248-542.000.
Tsuchiya, Katsumi, to Bunton Company. Greensmower with powered, vertically adjustable lawn conditioning roller. 4,481,757, Cl. 56-16.900.
Tsuda, Tadashi; Hiramatsu, Seiichiro; Maeno, Tsuyoshi; and Ohtsuka, Mitsugi, to Nippondenso Co., Ltd. Device for detecting failure of ultrasonic apparatus. 4,482,889, Cl. 340-514.000.
Tsudakomo Kogyo Kabushiki Kaisha: *See*—
Takegawa, Yujiro, 4,481,983, Cl. 139-452.000.
Tsugane, Shuzo, to Nippon Electric Co., Ltd. Apparatus for converting digital signals of first length code into second length codes. 4,482,886, Cl. 340-347.0DD.
Tsukada, Tsutomu; Wani, Etsuo; Ukai, Katsumi; and Saitoh, Teruo, to Anelva Corporation. Dry etching apparatus comprising etching chambers of different etching rate distributions. 4,482,419, Cl. 156-345.000.
Tsukahara, Kenji; Mutsukura, Kouji; and Inoue, Takayoshi, to Nippondenso Co., Ltd. Fuel injection apparatus of internal combustion engine. 4,481,921, Cl. 123-304.000.
Tsukamoto, Masuya, to Kabushiki Kaisha Teikoku Denki Seisakusho. Liquefied gas transfer apparatus. 4,481,781, Cl. 62-55.000.
Tsumura, Minoru: *See*—
Mochida, Ei; Kudo, Takashi; Sugawara, Toshiyuki; and Tsumura, Minoru, 4,482,636, Cl. 436-518.000.
Tsurushima, Katsuaki; and Shintani, Kenji, to Sony Corporation. Objective lens mount and drive for optical disc player. 4,482,988, Cl. 369-45.000.
Tsuruta, Keiji: *See*—
Ohta, Yoshihiro; Kawakami, Hidenori; and Tsuruta, Keiji, 4,482,880, Cl. 336-217.000.
Tsuzuki, Hiroyoshi; Tokuda, Ryuji; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Electrically operated camera and disabling device therefor. 4,482,236, Cl. 354-412.000.
Turchan, Michael J., deceased (by Turchan, Susan B., administratrix); Moses, Peter R.; and Taylor, Alwyn H., to Duracell Inc. Cell with safe venting electrolyte. 4,482,613, Cl. 429-53.000.
Turchan, Susan B., administratrix: *See*—
Turchan, Michael J., deceased; Moses, Peter R.; and Taylor, Alwyn H., 4,482,613, Cl. 429-53.000.
Turner, William D.: *See*—
Sprague, Robert A.; and Turner, William D., 4,482,215, Cl. 350-356.000.
Twist, Peter J.; Bailey, Joseph; Briggs, Stuart P.; Mijovic, Miroslav V.; and Southby, David T., to Eastman Kodak Company. Photographic color developer compositions. 4,482,626, Cl. 430-380.000.
Tyler, Derek E.: *See*—
Young, Kenneth P.; Tyler, Derek E.; Cheskis, Harvey P.; and Watson, W. Gary, 4,482,012, Cl. 165-146.000.
Tzeng, Chin-Pyng J., to Rockwell International Corporation. Tracking ROM drive and sense circuit. 4,482,824, Cl. 307-530.000.
Tzoumis, Nicholas: *See*—
DeVera, Dennis; and Tzoumis, Nicholas, 4,482,172, Cl. 285-137.00R.
Uchida, Yasumi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,482,562, Cl. 424-263.000.
Uda, Masahiro; Ohno, Satoru; and Hoshi, Tutomu, to National Research Institute for Metals. Apparatus for producing fine metal particles. 4,482,134, Cl. 266-217.000.
Udovich, Carl A.; and Eryman, William S., to Standard Oil Company (Indiana). Process for the production of maleic anhydride. 4,482,726, Cl. 549-260.000.
Ueda, Masahiro: *See*—
Hori, Shinichi; Ohnishi, Yasuichi; Ono, Makoto; Ueda, Masahiro; and Noba, Masahiko, 4,482,812, Cl. 290-38.00R.
Uemura, Morito: *See*—
Nakagawa, Satoshi; Sugita, Hiroshi; Kida, Shuzi; Uemura, Morito; and Kishi, Ken-ichi, 4,482,629, Cl. 430-542.000.
Ueno, Kouji: *See*—
Mano, Toru; Fukuda, Takeshi; Fukushima, Toshitaka; Ueno, Kouji; and Tanaka, Kazuo, 4,482,914, Cl. 357-68.000.
Ueyama, Yoshiji: *See*—
Miki, Takao; Asayama, Yoshiaki; and Ueyama, Yoshiji, 4,481,926, Cl. 123-463.000.
Ujfelusi, Elek: *See*—
Natkai, Lajos; and Ujfelusi, Elek, 4,482,305, Cl. 418-48.000.
Ujhelyi, Gaspar, to Potdevin Machine Company. Bag baling process. 4,481,751, Cl. 53-412.000.
Ukai, Katsumi: *See*—
Tsukada, Tsutomu; Wani, Etsuo; Ukai, Katsumi; and Saitoh, Teruo, 4,482,419, Cl. 156-345.000.
Unagami, Shigeyuki; Ihira, Kuninosuke; and Kaku, Takashi, to Fujitsu Limited. Digital automatic gain control circuit. 4,482,973, Cl. 364-602.000.
Unger, Eberhart; Stuckmann, Dieter; and Hein, Jurgen, to Gewerkschaft Eisenhutte Westfalia. Drive shields for tunnel-driving apparatus. 4,482,270, Cl. 405-145.000.
Uni-Cardan Aktiengesellschaft: *See*—
Petrzelka, Miloslav, 4,482,337, Cl. 464-128.000.
Union Camp Corporation: *See*—
Pavlin, Mark S., 4,482,765, Cl. 568-875.000.
Union Carbide Corporation: *See*—
Barthel, Alfred, 4,481,779, Cl. 62-48.000.
Chao, Chien C.; and Sherman, John D., 4,482,761, Cl. 568-833.000.
Delano, Mark A., 4,481,780, Cl. 62-52.000.
Noshay, Allen; Karol, Frederick J.; and Jorgensen, Robert J., 4,482,687, Cl. 526-125.000.
Pollock, Charles B.; Murzyn, Patrick J.; Brennom, Stephen O.; and Lambert, James N., 4,482,392, Cl. 134-7.000.
Somekh, George S., 4,482,768, Cl. 568-918.000.
Whysall, Michael, 4,482,361, Cl. 55-26.000.
Uniroyal, Inc.: *See*—
Rowland, Donald G.; and Heck, Rhomie L., III, 4,482,650, Cl. 521-89.000.
United Aircraft Products, Inc.: *See*—
Mort, Charles B.; and DeSalve, Dennis W., 4,482,415, Cl. 156-91.000.
United Conveyor Corporation: *See*—
Margison, Elwood R., 4,481,831, Cl. 73-861.730.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Forbes, George M.; and Seaney, Robert J., 4,482,890, Cl. 340-556.000.
United States of America
Agriculture: *See*—
Jurd, Leonard, 4,482,728, Cl. 549-435.000.
Air Force: *See*—
Backlund, John G.; and Gibler, David L., 4,482,113, Cl. 244-129.500.
Bilek, Frank V.; and Buell, David N., 4,482,900, Cl. 343-915.000.
Cummings, Robert J., 4,482,112, Cl. 244-122.0AG.
Cunniff, Kevin F., 4,481,707, Cl. 29-580.000.
Eylon, Daniel; and Froes, Francis H., 4,482,398, Cl. 148-11.50F.
Facklam, Roger L., 4,482,259, Cl. 368-118.000.
Ortwerth, Paul J.; and Lampson, Alan I., 4,483,006, Cl. 372-58.000.
Stephens, William D.; and Nieder, Erin G., 4,482,406, Cl. 149-19.400.
Stephens, William D.; and Rodman, Brenda K., 4,482,407, Cl. 149-19.400.
Stephens, William D.; and Rodman, Brenda K., 4,482,408, Cl. 149-19.400.
Stephens, William D.; and Rodman, Brenda K., 4,482,409, Cl. 149-19.400.
Stephens, William D.; and Jones, Linda E., 4,482,410, Cl. 149-19.400.
Stephens, William D.; and Jones, Linda E., 4,482,411, Cl. 149-19.400.
Witucki, Edward F.; and Flanagan, Joseph E., 4,482,404, Cl. 149-19.100.
Army: *See*—
Camplin, Harry R.; and Golden, Patrick, 4,482,366, Cl. 55-273.000.
Energy: *See*—
Baker, Ray W.; Pawlak, Donald A.; and Ramey, Alford J., 4,482,129, Cl. 251-334.000.
Bandyopadhyay, Gautam; and Galvin, Thomas M., 4,482,481, Cl. 252-628.000.
Chen, Hao-Lin, 4,482,525, Cl. 422-186.000.
Duchane, David V.; and Barthell, Barry L., 4,481,999, Cl. 164-6.000.
Foreman, Kenneth M.; and Gilbert, Barry L., 4,482,290, Cl. 415-2.00A.
Friedericy, Johan A.; and Towgood, Dennis A., 4,481,840, Cl. 74-572.000.
Mitchell, Kim W., 4,482,780, Cl. 136-258.000.
Smith, Jack E.; and Thomas, David G., 4,481,830, Cl. 73-861.710.
National Aeronautics and Space Administration: *See*—
Anderson, Lynn M., 4,482,778, Cl. 136-246.000.
Anderson, Lynn M., 4,482,779, Cl. 136-255.000.
Navy: *See*—
Keller, Teddy M., 4,482,702, Cl. 528-299.000.
Lagakos, Nicholas; and Bucaro, Joseph A., 4,482,205, Cl. 350-96.340.
Patch, Stanley J., 4,482,319, Cl. 433-39.000.
U.S. Philips Corporation: *See*—
Bierhoff, Martinus P. M., 4,482,989, Cl. 369-46.000.
Blackburn, Anthony; and Readhead, John B., 4,482,807, Cl. 250-334.000.
Hill, Bernhard; and Much, Gerd, 4,482,214, Cl. 350-355.000.
Kohsiek, Cord H., 4,482,820, Cl. 307-303.000.
Kommoss, Klaus; and Schmidt, Erhard, 4,481,832, Cl. 73-862.080.
Pachel, Max; and Schneider, Norbert, 4,481,711, Cl. 30-34.100.
Vrielink, Hendrik; van der Ouderaa, Eduard M. A. M.; and Willemse, Adriaan, 4,482,954, Cl. 364-200.000.
Washington, Derek; King, Hewson N. G.; and Stubberfield, Pamela M., 4,482,836, Cl. 313-104.000.
Worster, Frederick E., 4,482,846, Cl. 315-371.000.

United States Steel Corporation: *See*—
George, Kenneth E., Jr., 4,482,865, Cl. 324-263.000.
United Technologies Corporation: *See*—
Lawsing, Joseph W., 4,482,091, Cl. 236-92.00R.
Meltz, Gerald; Newman, Leon A.; Dunphy, James R.; and Foster, Martin C., 4,482,247, Cl. 356-343.000.
University of California, Regents of the: *See*—
Mitchell, James K.; and Kao, Tsung-chung, 4,482,271, Cl. 405-157.000.
University of Chicago, The: *See*—
Winston, Roland, 4,483,007, Cl. 372-72.000.
University of Iowa Research Foundation: *See*—
Plapp, Bryce V.; and Chadha, Vijay K., 4,482,568, Cl. 424-275.000.
University of Leeds Industrial Services Limited: *See*—
Telfer, Stewart B.; Zervas, George; and Knott, Peter, 4,482,541, Cl. 424-128.000.
University of Pittsburgh: *See*—
Abraham, Donald J., 4,482,571, Cl. 424-317.000.
Unno, Kunihiko: *See*—
Suzuki, Ikuo; Unno, Kunihiko; and Ohta, Norio, 4,481,739, Cl. 51-5.00D.
UNR Industries, Inc.: *See*—
Siska, Thomas J.; and Obermeyer, James H., 4,482,042, Cl. 193-35.00A.
UOP Inc.: *See*—
Bajek, Walter A., 4,481,833, Cl. 73-863.210.
Carson, Don B.; and James, Robert B., Jr., 4,482,369, Cl. 62-18.000.
Imai, Tamotsu, 4,482,767, Cl. 568-899.000.
Kemp, Thomas L., 4,482,451, Cl. 208-161.000.
Kurek, Paul R., 4,482,741, Cl. 564-415.000.
Neuzil, Richard W., 4,482,777, Cl. 585-828.000.
Wagner, Walter R.; and Bearl, Leslie K., 4,482,086, Cl. 277-12.000.
Urbano, Enrique. Security doors. 4,481,887, Cl. 109-3.000.
Ushio Denki Kabushikikaisha: *See*—
Hiramoto, Tatsumi, 4,482,395, Cl. 148-1.500.
Ushio, Masaru; Morita, Toru; Ishii, Takeshi; and Oishi, Yasuyuki, to Nippon Oil Company, Ltd. Process for catalytic reaction of heavy oils. 4,482,450, Cl. 208-152.000.
USM Corporation: *See*—
Le Bayon, Rene; Faucon, Roger; and Legrix, Jacqueline, 4,482,617, Cl. 429-143.000.
USV Pharmaceutical Corporation: *See*—
Huang, Fu-chih; Jones, Howard; and Chan, Wan-Kit, 4,482,544, Cl. 424-177.000.
Utilux Pty. Limited: *See*—
Karl, Walter, 4,482,199, Cl. 339-74.00R.
Vadnais, Kenneth, to New Product, Inc. Adjustable plastic film bag mouth support. 4,482,116, Cl. 248-99.000.
Vaida, George J. Louver assembly. 4,481,734, Cl. 49-92.000.
Vainberg, Irina A.: *See*—
Kljuev, Vladimir V.; Kozlov, Valery P.; Degterev, Alexandr P.; Vainberg, Irina A.; Demidov, Vladimir V.; and Filimonov, Anatoly N., deceased, 4,481,825, Cl. 73-655.000.
Vair, Gary G.: *See*—
Groom, Jay L., Jr.; Smith, Patricia J.; and Vair, Gary G., 4,483,002, Cl. 371-29.000.
Valeo: *See*—
Jacquet, Maurice, 4,482,011, Cl. 165-67.000.
Valk, Donald R.: *See*—
Spitz, Rodney D.; and Valk, Donald R., 4,482,381, Cl. 106-90.000.
Valmet Oy: *See*—
Vedenpaa, Timo, 4,481,723, Cl. 34-114.000.
Valspar Corporation, The: *See*—
Liu, Tony Y., 4,482,661, Cl. 523-439.000.
Van Antwerp, Ferne R. Hitching guide. 4,482,166, Cl. 280-479.00A.
Van Basshuysen, Richard; and Stock, Dieter, to Audi NSU Auto Union Aktiengesellschaft. Internal combustion engine with a knocking sensor. 4,481,807, Cl. 73-35.000.
VanBreemen, Bertram, to RCA Corporation. Rear projection television screen having a multi-surface Fresnel lens. 4,482,206, Cl. 350-128.000.
Vancil, Paul W.: *See*—
Marouf, Mohamed A.; and Vancil, Paul W., 4,482,998, Cl. 370-62.000.
Van Court Carr, Richard: *See*—
Toseland, Bernard A.; and Van Court Carr, Richard, 4,482,769, Cl. 568-934.000.
van der Ouderaa, Eduard M. A. M.: *See*—
Vrielink, Hendrik; van der Ouderaa, Eduard M. A. M.; and Willemse, Adriaan, 4,482,954, Cl. 364-200.000.
Van't Hoff, Joris: *See*—
DeCuyper, Jacques; Broekaert, Edwin; and Van't Hoff, Joris, 4,482,454, Cl. 209-166.000.
Van Zeeland, Donald L.: *See*—
Ryczek, Lawrence J.; and Van Zeeland, Donald L., 4,482,818, Cl. 307-257.000.
Varrasso, Eugene C., to Owens-Corning Fiberglas Corporation. Arc gap controller for glass-melting furnace. 4,483,008, Cl. 373-27.000.
Varrasso, Eugene C.: *See*—
Dewey, Keith L.; and Varrasso, Eugene C., 4,482,261, Cl. 374-181.000.
Vasvari nee Debreczy, Lelle: *See*—
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,482,557, Cl. 424-251.000.
Vaxmonsky, Joseph J.: *See*—
Pawlowski, Thomas D.; and Vaxmonsky, Joseph J., 4,482,080, Cl. 221-310.000.
VDO Adolf Schindling AG: *See*—
Hauschild, Wolfgang; and Kruck, Dieter, 4,482,884, Cl. 340-52.00D.
Schlick, Horst, 4,482,301, Cl. 417-317.000.
VEB Kombinat Medizin- und Labortechnik Leipzig: *See*—
Baudisch, Hans-Dieter; and Lippoldt, Roland, 4,482,522, Cl. 422-104.000.
Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Rudolph, Harald, 4,481,882, Cl. 101-148.000.
VEB Kombinat Wolle und Seide: *See*—
Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, 4,481,763, Cl. 57-81.000.
Vedenpaa, Timo, to Valmet Oy. Paper machine multiple cylinder dryer. 4,481,723, Cl. 34-114.000.
Venot, Jean, to ASA S.A. Process and device for making spun yarns comprising a core. 4,481,759, Cl. 57-5.000.
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Vergues, Jacques; and Rubet, Roland, to CROUZET. Disconnectable electromagnetic eccentric actuator. 4,482,828, Cl. 310-83.000.
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Vernez, Paul A.: *See*—
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Johansson, Kent A., 4,482,224, Cl. 353-101.000.
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Brandi, Roberto; Bucaneve, Giovanni; Della Greca, Antonio; Sebastiani, Gaetano; Toffano, Francesco; and Vielmo, Paolo, 4,482,274, Cl. 405-224.000.
Vincett, Paul S.: *See*—
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Vock, Friedrich; Lessmeister, Peter; and Kirchner, Ralf, to BASF Farben & Fasern AG. Process and apparatus for preparing aqueous dispersions of synthetic resins. 4,482,658, Cl. 523-348.000.
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Voorhees, John L. Distillation apparatus with a liquid-vapor separating device having three chambers. 4,482,431, Cl. 202-176.000.
Voorhees, Joseph E., to Endure, Inc. Process for treating materials to improve their structural characteristics. 4,482,005, Cl. 165-2.000.
Voss, Raymond G., to Phillips Petroleum Company. Valve and material supply system. 4,482,045, Cl. 198-670.000.
Vrielink, Hendrik; van der Ouderaa, Eduard M. A. M.; and Willemse, Adriaan, to U.S. Philips Corporation. Signal processor device with conditional interrupt module and multiprocessor system employing such devices. 4,482,954, Cl. 364-200.000.
Vuyk, Cor K.: *See*—
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W. L. Gore & Associates, Inc.: *See*—
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Wada, Chuzoh; and Matsuda, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Burner with oxygen shortage sensor. 4,482,311, Cl. 431-15.000.
Wada, Tetsuya; Ishii, Masaji; Miyai, Akira; and Hagiwara, Hirotoshi, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermionic emission cathode and preparation thereof. 4,482,839, Cl. 313-346.00R.
Wadsworth, Alan: *See*—
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Wagner, Ovner R., Jr.; Murphy, Robert P., Jr.; Dauben, Dwight L.; and Smith, Roger L., to Standard Oil Company, The. Multi-tracer logging technique. 4,482,806, Cl. 250-260.000.
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Waite, Frederick A.: *See*—
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Wajima, Motoyo: *See*—
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Wallis, Christopher J.: *See*—
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Walter, Lothar; Brandentein, Manfred; Ernst, Horst M.; and Olschewski, Armin, to SKF Kugellagerfabriken GmbH. Torque transmitting bearing assembly for members adapted for a relative longitudinal movement and method of assembly thereof. 4,482,338, Cl. 464-167.000.

Walther, Gerhard: *See*—
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Walton, Richard W.: *See*—
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Gebhardt, Uwe; Augart, Helmut; and Knecht, Adolf. 4,482,554, Cl. 424-246.000.
Schneider, Michael; and Knecht, Adolf. 4,482,542, Cl. 424-157.000.
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Wasco Products, Inc.: *See*—
Jentoft, Arthur P.; and Couture, Paul A., 4,481,735, Cl. 49-325.000.

Washington, Derek; King, Hewson N. G.; and Stubberfield, Pamela M., to U.S. Philips Corporation. Electron multipliers. 4,482,836, Cl. 313-104.000.

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Wassell, Mark E.: *See*—
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Watson, Gary E.; and Doornek, James R., to Douglas Dynamics, Inc. Log splitter. 4,481,988, Cl. 144-193.00A.

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Watson, Paul H.: *See*—
Wolf, Joachim E.; Watson, Paul H.; and Radus, Raymond J., 4,482,945, Cl. 363-129.000.

Watson, W. Gary: *See*—
Young, Kenneth P.; Tyler, Derek E.; Cheskis, Harvey P.; and Watson, W. Gary. 4,482,012, Cl. 165-146.000.

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Weber, Karl-Heinz: *See*—
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Wedgtrac Corporation: *See*—
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Weinert, Raymond J.: *See*—
Desmond, Michael J.; Benton, Kenneth C.; and Weinert, Raymond J., 4,482,639, Cl. 502-117.000.

Weinert, Robert W.; and Watt, Donald H., to Westinghouse Electric Corp. Method for obtaining oriented gold and piezoelectric films. 4,482,833, Cl. 310-313.00A.

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Weisman, Morey. Modified polyurethane product having improved load bearing characteristics. 4,482,582, Cl. 427-185.000.

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Weissmann, Klaus, to Leybold-Heraeus GmbH. Energy-beam welding machine. 4,482,796, Cl. 219-121.0EC.

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Wentzell, Timothy H., to Combustion Engineering, Inc. Nozzle plug for submersible vessel. 4,482,076, Cl. 220-232.000.

Werblinski, Dieter; and Hoffmann, Heino, to Anshutz & Co. GmbH. Adjusting arrangement for compass repeaters. 4,481,718, Cl. 33-317.00R.

Wessel, Wolf, to Robert Bosch GmbH. Rpm-to-voltage converter. 4,482,823, Cl. 307-519.000.

Westaflex-Werk L.U.F. Westerbarkey GmbH & Co.: *See*—
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Westermark, Mats. Heat pumping process based on the principle of absorption. 4,482,466, Cl. 252-69.000.

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Zettier, Karl-Heinz. 4,482,344, Cl. 494-70.000.

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Enriquez, Emanuel E.; and MacDonald, Robert C., 4,482,032, Cl. 187-29.00R.
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Wolf, Joachim E.; Watson, Paul H.; and Radus, Raymond J., 4,482,945, Cl. 363-129.000.

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Weston, Paul: *See*—
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Wheeler, Jennifer M., to ITT Industries, Inc. Ceramic capacitors and dielectric compositions. 4,482,935, Cl. 361-321.000.

Whelan, John W., to Impakt Products, Inc. High integrity tamper resistant container. 4,483,018, Cl. 383-5.000.

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Whirlpool Corporation: *See*—
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Lynch, Neil P., 4,481,787, Cl. 62-180.000.
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Widerby, Lennart, to Flakt Aktiebolag. Apparatus for mounting a ventilation element in a ventilation conduit. 4,482,267, Cl. 403-377.000.

Widman, Jan, to Additainer AB. Metal covered cellular PVC. 4,482,589, Cl. 428-35.000.

Wiethoff, Roger H.; and Heron, Bruce G., to FMC Corporation. Automatic loading system for fixed ammunition at gun elevation. 4,481,862, Cl. 89-46.000.

Wilchek, Meir: *See*—
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Willenborg, James F., to INMAC. Connector box. 4,482,200, Cl. 339-103.00M.

Willers, Gary P.: *See*—
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Williams, David L.; Southwick, Everett W.; and Houminer, Yoram, to Philip Morris, Incorporated. Smoking compositions containing novel acylpyrazine flavorants. 4,481,957, Cl. 131-278.000.

Williams, Dennis L.: *See*—
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Williams, James H., to Borden, Inc. Low emitting aqueous formulations of aminoplast resins and processes for manufacturing them. 4,482,699, Cl. 528-260.000.

Willis, Stephen B.; and Boyce, Pamela J., to Dow Chemical Company, The. Modified polyalkylenepolyamines. 4,482,667, Cl. 523-400.000.

Wilson, David A.: *See*—
Dias, J. Fleming; Karrer, H. Edward; Larson, John D., III; Wilson, David A.; and Hanafy, Amin M., 4,482,834, Cl. 310-327.000.

Wilson, David N.: *See*—
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Wilson, Michael E., to Milliken Research Corporation. Comminuted inorganic materials. 4,482,655, Cl. 523-200.000.

Wilson, Randall B.: *See*—
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Winderl, Siegfried: *See*—
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Wingard, Robert E., Jr.: *See*—
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Winston, Roland, to University of Chicago, The. Energy transmission with respect to convex sources and receivers. 4,483,007, Cl. 372-72.000.

Wirth, Rick C., to General Motors Corporation. Hydraulic lash adjuster oil metering ball valve. 4,481,913, Cl. 123-90.350.

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Witt, Edward, to Colgate-Palmolive Company. Water-soluble, pressure-sensitive adhesive composition, and process for making same. 4,482,675, Cl. 525-132.000.

Witt, Frank, to Instrument Flight Research Inc. Flight training glasses. 4,482,326, Cl. 434-36.000.

Wittwer, Fritz; and Tomka, Ivan, to Warner-Lambert Company. Method of conditioning a water swellable hydrocolloid. 4,482,386, Cl. 106-135.000.

Witucki, Edward F.; and Flanagan, Joseph E., to United States of America, Air Force. Azido nitramino ether containing solid propellants. 4,482,404, Cl. 149-19.100.

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Wohlgemuth, Jurgen, to Siemens Aktiengesellschaft. Percussion instrument. 4,482,324, Cl. 433-215.000.

Wolens, John. Appliance caddy. 4,482,196, Cl. 339-2.00R.

Wolf, Franz-Josef; Pletsch, Hubert; and Benneyan, Gregoire, to WOCO Franz-Josef & Co. Elastomeric loop. 4,482,136, Cl. 267-152.000.

Wolf, Joachim E.; Watson, Paul H.; and Radus, Raymond J., to Westinghouse Electric Corp. Transformer for low distortion rectifier system. 4,482,945, Cl. 363-129.000.

Wolff, Leslie C. Exercise equipment. 4,482,152, Cl. 272-130.000.

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Woo, James T. K.; Ting, Vincent W.; and Marcinko, Richard M., to SCM Corporation. Base for a graft polymer, novel graft polymer compositions, solvent and water-reducible coatings incorporating the novel graft polymers, and processes for making them. 4,482,671, Cl. 525-31.000.

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Wood, Thomas G.; and Oblack, Steven M., to E. R. Squibb & Sons, Inc. Powdered wax, tablet coated therewith and method. 4,482,387, Cl. 106-270.000.

Woodhouse, Michael E., to Du Pont de Nemours, E. I., and Company. Coating composition of an acrylic polymer, a polyester resin and an ethylene/vinyl acetate copolymer. 4,482,609, Cl. 428-458.000.

Worden, Donald A.: *See*—
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Worster, Frederick E., to U.S. Philips Corporation. Television line deflection arrangement. 4,482,846, Cl. 315-371.000.

Wossner, Felix; Axthammer, Ludwig; Heyer, Gunther; and Itzinger, Hermann, to Fichtel & Sachs AG. Hydropneumatic damping device. 4,482,036, Cl. 188-322.130.

Wright, Benny W.: *See*—
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Wright, Sam B. Explosive molding composition and method for preparation thereof. 4,482,405, Cl. 149-19.300.

Wurmli, Arthur, to Rieter Machine Works Ltd. Traveller for ring spinning machine. 4,481,764, Cl. 57-125.000.

Wyber, James P.: *See*—
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Wyrepak Industries, Inc.: *See*—
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Yahata, Haruki: *See*—
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Yamada Dobby Co., Ltd.: *See*—
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Yamada, Shozo: *See*—
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Yamada, Tomoharu: *See*—
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Fujishita, Kusuo; Sakamoto, Hideshi; Yamazawa, Tomio; and Yamaguchi, Junichi, 4,482,595, Cl. 428-95.000.

Yamaguchi, Keizaburo; Sugimoto, Kenichi; and Tanabe, Yoshimitsu, to Mitsui Toatsu Chemicals Inc. Process for preparing of 3,3'-diamino diphenylsulfones. 4,482,742, Cl. 564-412.000.

Yamamori, Naoki; Yokoi, Junji; and Yoshikawa, Motoyoshi, to Nippon Paint Co., Ltd. Hydrolyzable polyester resins, varnishes and coating compositions containing the same. 4,482,701, Cl. 528-295.500.

Yamamoto, Hitoshi: *See*—
Takada, Toshiyuki; and Yamamoto, Hitoshi, 4,481,909, Cl. 123-73.0CC.

Yamamoto, Kazuhiro; and Atobe, Masaaki, to Nippon Electric Co., Ltd. Circuit for eliminating spurious components resulting from burst control in a TDMA system. 4,483,000, Cl. 370-95.000.

Yamamoto, Minoru: *See*—
Sakata, Jiro; Hirai, Masana; and Yamamoto, Minoru, 4,481,808, Cl. 73-61.10R.

Yamamoto, Toyoji: *See*—
Makabe, Hideki; Yamamoto, Toyoji; Matsueda, Yoshio; Ito, Yasunori; and Yamada, Katsuto, 4,482,245, Cl. 356-30.000.

Yamamoto, Yukio; and Yoritaka, Masashi, to Mazda Motor Corporation. Method for making pitting resistant cast iron product. 4,482,396, Cl. 148-3.000.

Yamanashi, Fumiaki; Hayashi, Yuzo; and Fujiwara, Yoshiyuki, to Alps Electric Co., Ltd. Liquid crystal mixture. 4,482,473, Cl. 252-299.100.

Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Inai, Yuichi; Suzuki, Yoshikazu; and Tagaya, Osamu, to Eisai Co., Ltd. Polyprenyl compounds. 4,482,734, Cl. 560-104.000.

Yamazaki, Norio; Takaoka, Naoyoshi; Shinoki, Mikio; and Huruichi, Ryonosuke, to Taiyo Sanso Co., Ltd. Method for producing purified gases. 4,482,362, Cl. 55-62.000.

Yamazaki, Shu: *See*—
Koizumi, Hideo; Koseki, Isamu; Morita, Tadashi; Yamazaki, Shu; and Fukuhara, Yoshio, 4,482,837, Cl. 378-144.000.

Yamazaki, Yoshio; Kawamoto, Kiyoaki; and Kawata, Shun, to Konishiroku Photo Industry Co., Ltd. Magnetic brush cleaning device. 4,482,244, Cl. 355-15.000.

Yamazawa, Tomio: *See*—
Fujishita, Kusuo; Sakamoto, Hideshi; Yamazawa, Tomio; and Yamaguchi, Junichi, 4,482,595, Cl. 428-95.000.

Yamrone, Brian M.: *See*—
Ems, Stephen C.; and Yamrone, Brian M., 4,482,826, Cl. 307-602.000.

Yanada, Tetsunosuke: *See*—
Nishiyama, Kazuo; Yanada, Tetsunosuke; and Arai, Michio, 4,482,393, Cl. 148-1.500.

Yanagi, Kunio; and Andoh, Munesato, to Jidoshi Kiki Co., Ltd. Waterproof seal ring for power brake booster housing. 4,482,160, Cl. 277-12.000.

Yanagiuchi, Shigenobu: *See*—
Morimoto, Masafumi; Yanagiuchi, Shigenobu; and Akizuki, Noboru, 4,482,981, Cl. 364-900.000.

Yanai, Nobuya: *See*—
Funakoshi, Satoshi; Morimoto, Kazuo; Kuboyama, Morio; Yanai, Nobuya; Yamada, Muneo; and Yokota, Hajime, 4,482,485, Cl. 260-112.00R.

Yasuda, Satoru: *See*—
Asao, Hideo; and Yasuda, Satoru, 4,481,895, Cl. 112-121.120.

Yasuda, Shuhei: *See*—
Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, 4,482,212, Cl. 350-334.000.

Yasukawa, Seiichi; Terui, Nobuhiko; and Fukuhara, Toru, to Nippon Kogaku K.K. Automatic focusing device for camera. 4,482,235, Cl. 354-402.000.

Yasukochi, Takashi; and Fukamachi, Yoshihiro, to Bridgestone Tire Company Limited. Method of folding annular band. 4,482,416, Cl. 156-133.000.

Yasuo, Yanagihara: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.

Yeakey, Ernest L.; and Zimmerman, Robert L., to Texaco Inc. Hydroxyalkyl bis(dialkylaminoalkyl)amine manufacture. 4,482,743, Cl. 564-477.000.

Yeda Research and Development Co. Ltd.: *See*—
Tamir, Hadassah; Karpiak, Stephen E.; and Wilchek, Meir, 4,482,567, Cl. 424-274.000.

Yializis, Angelo, to General Electric Company. Metallized capacitor with improved bilayer electrodes. 4,482,931, Cl. 361-273.000.

Yim, George. Traction rack for light trucks. 4,482,169, Cl. 280-759.000.

Yokoi, Junji: *See*—
Yamamori, Naoki; Yokoi, Junji; and Yoshikawa, Motoyoshi, 4,482,701, Cl. 528-295.500.

Yokota, Hajime: *See*—
Funakoshi, Satoshi; Morimoto, Kazuo; Kuboyama, Morio; Yanai, Nobuya; Yamada, Muneo; and Yokota, Hajime, 4,482,485, Cl. 260-112.00R.

Yokoyama, Shoji: *See*—
Miki, Nobuaki; Sobue, Norio; and Yokoyama, Shoji, 4,482,339, Cl. 474-28.000.

Yokoyama, Tatuo: *See*—
Tateishi, Iwao; Mizuta, Takemi; Yokoyama, Tatuo; and Kakutani, Nobuyasu, 4,482,965, Cl. 364-467.000.

Yokozawa, Masami: *See*—
Nishikawa, Mikio; Fujii, Hiroyuki; Tateno, Kenichi; and Yokozawa, Masami, 4,482,915, Cl. 357-72.000.

Yoneyama, Takao; Satoh, Ichiya; Obara, Sanshiro; Inoue, Tomoaki; and Koga, Tsuguaki, to Hitachi, Ltd. Method and apparatus for detecting metal wipe damages of plane bearing. 4,481,819, Cl. 73-593.000.

Yoritaka, Masashi: *See*—
Yamamoto, Yukio; and Yoritaka, Masashi, 4,482,396, Cl. 148-3.000.

Yoshiaki, Masuda: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.

Yoshida Kogyo K.K.: *See*—
Kanzaka, Yoshihiro, 4,481,696, Cl. 24-113.00R.
Yoshida, Yorikazu, 4,482,100, Cl. 242-55.000.

Yoshida, Masayuki; Nomura, Masami; and Ikejima, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. AC elevator control apparatus. 4,482,031, Cl. 187-29.00R.

Yoshida, Nobuyuki: *See*—
Furukawa, Hiroshi; Saito, Yuichi; Imai, Akio; Yoshida, Nobuyuki; and Okamoto, Yasushi, 4,482,678, Cl. 525-236.000.

Yoshida, Shinichi; and Kobayashi, Kazutaka, to Nippon Interphone Co. Ltd.; and Tokyo Electronic Industry Co., Ltd. Protective apparatus for pick-up tube. 4,482,920, Cl. 358-228.000.

Yoshida, Tsugushi; Sasaki, Hideharu; Sawaki, Toru; and Shimada, Keizo, to Teijin Limited. Wholly aromatic polyamide fiber nonwoven sheet and processes for producing the same. 4,482,603, Cl. 428-287.000.

Yoshida, Yorikazu, to Yoshida Kogyo K.K. Beam winding apparatus. 4,482,100, Cl. 242-55.000.

Yoshida, Yoshiaki: *See*—
Kurushima, Tadanori; Yoshida, Yoshiaki; and Kamiya, Kazuo, 4,481,765, Cl. 57-412.000.

Yoshigai Kikai Kinzoku Kabushiki Kaisha: *See*—
Yoshigai, Toshiharu, 4,482,033, Cl. 188-24.190.

Yoshigai, Toshiharu, to Yoshigai Kikai Kinzoku Kabushiki Kaisha. Caliper brake apparatus of the side-pull type. 4,482,033, Cl. 188-24.190.

Yoshikawa, Hisao: *See*—
Shimizu, Masami; Yoshikawa, Hisao; Kimura, Sosaku; Shiba, Kazuo; Maeno, Fumio; Fuwa, Shigehiro; and Mihara, Kuniyuki, 4,481,742, Cl. 51-165.800.

Yoshikawa, Motoyoshi: *See*—
Yamamori, Naoki; Yokoi, Junji; and Yoshikawa, Motoyoshi, 4,482,701, Cl. 528-295.500.

Yoshimi, Akiro; Takagi, Masashi; Sakurai, Masao; and Takemi, Akio, to Nippondenso Co., Ltd. Air conditioner control apparatus. 4,482,007, Cl. 165-21.000.

Yoshimura, Tatsushiro; Honda, Norimasa; and Terada, Tsutomu, to Daikin Kogyo Co., Ltd. Fluoroelastomer-containing non-tacky electrically conductive coating composition. 4,482,476, Cl. 252-511.000.

Yoshino, Hozo, to System Homes Company, Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Water heating system. 4,481,788, Cl. 62-181.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Saito, Tadao; and Ogawa, Riichi, 4,482,067, Cl. 215-12.00R.

Yoshioka, Mamoru: *See*—
Onaka, Hidemi; and Yoshioka, Mamoru, 4,482,508, Cl. 261-39.00A.

Yoshiteru, Tagawa: *See*—
Shinozaki, Yoshinobu; Motozo, Yasuno; Tadaaki, Iwamura; Hironari, Marushima; Yoshiteru, Tagawa; Ryoji, Takabe; Takashi, Moriyama; Shuzo, Fujii; Keiichi, Achiba; Hideo, Oishi; Yasuo, Yanagihara; and Yoshiaki, Masuda, 4,482,275, Cl. 406-12.000.

Young, Dennis L.: *See*—
Boeckman, Paul A.; and Young, Dennis L., 4,482,128, Cl. 251-163.000.

Young, Kenneth P.; Tyler, Derek E.; Cheskis, Harvey P.; and Watson, W. Gary, to International Telephone and Telegraph Corporation. Process and apparatus for continuous slurry casting. 4,482,012, Cl. 165-146.000.

Young, Rodney C.: *See*—
Roantree, Michael L.; and Young, Rodney C., 4,482,563, Cl. 424-267.000.

Yourd, Raymond A., III: *See*—
Gruber, Robert J.; Julien, Paul C.; and Yourd, Raymond A., III, 4,482,620, Cl. 430-99.000.

Yu, Kin C.; and Goss, Gary J., to Honeywell Information Systems Inc. Communication multiplexer sharing a free running timer among multiple communication lines. 4,482,982, Cl. 364-900.000.

Yuasa, Yoshio; Naruse, Kazuhiko; and Kawagoe, Nobukazu, to Minolta Camera Kabushiki Kaisha. Key switch input control circuit. 4,482,978, Cl. 364-900.000.

Yuguchi, Naoki; and Kawasaki, Keiichi, to Canon Kabushiki Kaisha. Medical X-ray inspection apparatus. 4,483,014, Cl. 378-173.000.

Yunan, Malak E., to Du Pont de Nemours, E. I., and Company. Field-connected explosive booster for initiating low-energy explosive connecting cords. 4,481,884, Cl. 102-313.000.

Yusa, Hideo: *See*—
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, 4,482,479, Cl. 252-630.000.

Zabel, Jack H., Jr.: *See*—
Reid, Philip L., 4,481,970, Cl. 137-223.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, 4,482,025, Cl. 180-255.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,482,910, Cl. 357-34.000.

Zanner, Georg; and Repa, Otto, to Carl Walther GmbH. Operating lever for the block and hammer of a self-loading hand firearm. 4,481,863, Cl. 89-138.000.

Zato, Thomas J.; and Skerlos, Peter C., to Zenith Electronics Corporation. Multi-function, multi-unit remote control system and method therefor. 4,482,947, Cl. 364-138.000.

Zdahl, Norbert: *See*—
Streitberger, Hans-Joachim; Lessmeister, Peter; and Zdahl, Norbert, 4,482,446, Cl. 204-181.00C.

Zeiss Ikon AG: *See*—
Hamme, Kurt, 4,481,796, Cl. 70-107.000.
Zelkowitz, Hyman L.; Crawford, Jeffrey D.; and Mercer, Lucia, to Knoll International, Inc. Table top assembly. 4,482,119, Cl. 248-188.000.
Zell, Michael N.: *See*—
Beck, John L.; Bornhorst, Randy J.; Smith, Donald J.; and Zell, Michael N., 4,482,929, Cl. 360-133.000.
Zellweger Uster Ltd.: *See*—
Thomann, Christoph, 4,481,820, Cl. 73-597.000.
Zenith Electronics Corporation: *See*—
Zato, Thomas J.; and Skerlos, Peter C., 4,482,947, Cl. 364-138.000.
Zervas, George: *See*—
Telfer, Stewart B.; Zervas, George; and Knott, Peter, 4,482,541, Cl. 424-128.000.
Zettler, Karl-Heinz, to Westfalia Separator AG. Centrifuge drum for clarifying and separating liquids. 4,482,344, Cl. 494-70.000.
Zeugner, Horst: *See*—
Roemer, Dietmar; Ruhland, Michael; Zeugner, Horst; Milkowski, Wolfgang; and Liepmann, Hans, 4,482,548, Cl. 424-244.000.
Ziernicki, Richard, to Over-Lowe Company. Lamp supporting unit for absorbing shocks and vibrations. 4,482,125, Cl. 248-604.000.
Zimmerman, Robert L.: *See*—
Yeakey, Ernest L.; and Zimmerman, Robert L., 4,482,743, Cl. 564-477.000.
Zimmermann, Rolf: *See*—
Just, Christoph; Ritz, Jurgen; and Zimmermann, Rolf, 4,482,674, Cl. 525-124.000.
Ziph, Benjamin: *See*—
Meijer, Roelf J.; and Ziph, Benjamin, 4,481,771, Cl. 60-517.000.
Zito, Ralph, Jr., to Gel, Inc. Zinc-bromine battery with long term stability. 4,482,614, Cl. 429-70.000.
Zitzelsberger, Emil: *See*—
Schmitt, Manfred; and Zitzelsberger, Emil, 4,481,974, Cl. 137-514.000.
Zoellner, Philip. Convertible easel. 4,482,185, Cl. 297-135.000.
Zullo, Antonio; and Roffi, Roberto, to Sasib S.p.A. Modular rocking lever for cam mechanisms. 4,481,839, Cl. 74-569.000.
Zwilling, Brian R., to Questor Corp. Exercising device. 4,482,151, Cl. 272-123.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF NOVEMBER, 1984

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. Re. 31,731, Cl. 562-435.000.

Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, to Bristol-Myers Company. Process for the preparation of the crystalline monohydrate of 7-(D-α-amino-α-(p-hydroxyphenyl)acetamido)-3-methyl-3-cephem-4-carboxylic acid. Re. 31,730, Cl. 544-30.000.

Bristol-Myers Company: *See*—
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, Re. 31,730, Cl. 544-30.000.

Davidson, Richard A., to Feature Film Services. Subscriber-limited reception television broadcast security encoder-decoder system. Re. 31,735, Cl. 358-124.000.

DiMaria, Donnelli J.; and Young, Donald R., to International Business Machines Corporation. Moderate field hole and electron injection from one interface of MIM or MIS structures. Re. 31,734, Cl. 357-23.000.

Du Pont de Nemours, E. I., and Company: *See*—
Reilly, Thomas A.; Reitz, Charles F.; and Smith, Robert D., Re. 31,732, Cl. 165-180.000.

Feature Film Services: *See*—
Davidson, Richard A., Re. 31,735, Cl. 358-124.000.

General Binding Corporation: *See*—
Giulie, Joe D.; and Worcester, Leslie E., Re. 31,729, Cl. 156-366.000.

Giulie, Joe D.; and Worcester, Leslie E., to General Binding Corporation. Power actuated laminating machine. Re. 31,729, Cl. 156-366.000.

Haworth Mfg., Inc.: *See*—
Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., Re. 31,733, Cl. 339-4.000.

Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., to Haworth Mfg., Inc. Wall panel with prewired power system. Re. 31,733, Cl. 339-4.000.

International Business Machines Corporation: *See*—
DiMaria, Donnelli J.; and Young, Donald R., Re. 31,734, Cl. 357-23.000.

Moravec, John V.: *See*—
Mueller, David J.; Prysby, Daniel G.; Moravec, John V.; and Watson, George A., Re. 31,736, Cl. 364-900.000.

Mueller, David J.; Prysby, Daniel G.; Moravec, John V.; and Watson, George A., to Rockwell International Corporation. Reactive computer system adaptive to a plurality of program inputs. Re. 31,736, Cl. 364-900.000.

Prysby, Daniel G.: *See*—
Mueller, David J.; Prysby, Daniel G.; Moravec, John V.; and Watson, George A., Re. 31,736, Cl. 364-900.000.

Reilly, Thomas A.; Reitz, Charles F.; and Smith, Robert D., to Du Pont de Nemours, E. I., and Company. Plastic heat exchange apparatus. Re. 31,732, Cl. 165-180.000.

Reitz, Charles F.: *See*—
Reilly, Thomas A.; Reitz, Charles F.; and Smith, Robert D., Re. 31,732, Cl. 165-180.000.

Rockwell International Corporation: *See*—
Mueller, David J.; Prysby, Daniel G.; Moravec, John V.; and Watson, George A., Re. 31,736, Cl. 364-900.000.

Saylor, Charles J.: *See*—
Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., Re. 31,733, Cl. 339-4.000.

Smith, Robert D.: *See*—
Reilly, Thomas A.; Reitz, Charles F.; and Smith, Robert D., Re. 31,732, Cl. 165-180.000.

Stemer, Jacques: *See*—
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, Re. 31,730, Cl. 544-30.000.

Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 31,731, Cl. 562-435.000.

Watson, George A.: *See*—
Mueller, David J.; Prysby, Daniel G.; Moravec, John V.; and Watson, George A., Re. 31,736, Cl. 364-900.000.

Weber, Abraham: *See*—
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, Re. 31,730, Cl. 544-30.000.

Wilson, Harold R.: *See*—
Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., Re. 31,733, Cl. 339-4.000.

Worcester, Leslie E.: *See*—
Giulie, Joe D.; and Worcester, Leslie E., Re. 31,729, Cl. 156-366.000.

Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 31,731, Cl. 562-435.000.

Young, Donald R.: *See*—
DiMaria, Donnelli J.; and Young, Donald R., Re. 31,734, Cl. 357-23.000.

LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Takeuchi, Akitaka; Abe, Takeshi; and Endou, Hiroshi, 276,340, Cl. D14-94.000.

Aktiebolaget Volvo: *See*—
Wilsgaard, Jan, 276,332, Cl. D12-184.000.

Alco Manufacturing Co.: *See*—
Kitchen, Fern, 276,288, Cl. D6-502.000.

Allibert S.A.: *See*—
Boroch, Jersy, 276,291, Cl. D4-121.000.
Boroch, Jersy, 276,293, Cl. D6-535.000.

Appor Limited: *See*—
Banks, Stewart, 276,294, Cl. D6-545.000.

Audiovox Corp.: *See*—
Turner, Earl W.; and Lyall, George, 276,306, Cl. D8-330.000.

Baffo, Charles M., to Mobil Oil Corporation. Service station. 276,370, 11-13-84, Cl. D25-1.000.

Baffo, Charles M., to Mobil Oil Corporation. Service station. 276,371, 11-13-84, Cl. D25-1.000.

Baffo, Charles M., to Mobil Oil Corporation. Canopy. 276,372, 11-13-84, Cl. D25-56.000.

Baffo, Charles M., to Mobil Oil Corporation. Canopy. 276,373, 11-13-84, Cl. D25-56.000.

Ballone, Michael P.: *See*—
La Police, George; and Ballone, Michael P., 276,344, Cl. D15-69.000.

Banks, Stewart, to Appor Limited. Liquid dispenser. 276,294, 11-13-84, Cl. D6-545.000.

Bell, George G., Jr., to Un-Common Carrier Corp. Load body. 276,326, 11-13-84, Cl. D12-96.000.

Boroch, Jersy, to Allibert S.A. Bathroom brush holder with brush. 276,291, 11-13-84, Cl. D4-121.000.

Boroch, Jersy, to Allibert S.A. Wall-mounted drinking glass holder. 276,293, 11-13-84, Cl. D6-535.000.

Brennan, James R. Handset telephone in simulated space shuttle form. 276,337, 11-13-84, Cl. D14-53.000.

Bulgari, Marina, to Zoldia Anstalt, Now Marina B Creation Societe Anonyme. Spring bracelet. 276,321, 11-13-84, Cl. D11-3.000.

Burrage, Robert H. Combined seafood mallet, cracker and knife. 276,301, 11-13-84, Cl. D7-101.000.

C & D Consulting & Design AG: *See*—
Luthy, Ernst, 276,289, Cl. D6-381.000.

Canon Kabushiki Kaisha: *See*—
Masaki, Nobuo, 276,346, Cl. D16-31.000.

Carbajales Santa-Eulalia, Javier B.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 276,323, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 276,324, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 276,325, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a saint bernard. 276,323, 11-13-84, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a hunting dog. 276,324, 11-13-84, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a siamese cat. 276,325, 11-13-84, Cl. D11-158.000.

Chan, Ming K. Gas barbeque. 276,303, 11-13-84, Cl. D7-337.000.

Channel-Kor Systems, Inc.: *See*—
Miller, Melvin M., 276,298, Cl. D6-470.000.

Chemcraft, Inc.: *See*—
Hayden, William G., 276,295, Cl. D6-561.000.

Churchill, Robert L., to Kransco Manufacturing, Inc. Aqua planing board. 276,359, 11-13-84, Cl. D21-228.000.

Clarion Corporation: *See*—
Yoshida, Hiroshi, 276,335, Cl. D14-5.000.

Clawson, Burrell E.; and Weigl, James. In line flow connector for a respirator. 276,369, 11-13-84, Cl. D24-53.000.

Collister, Kenneth D., to Miles Laboratories, Inc. Spectrophotometer. 276,315, 11-13-84, Cl. D10-46.000.

Cooper, Jonathan, to Royston Manufacturing Corporation. Outdoor telephone booth. 276,296, 11-13-84, Cl. D6-555.000.

Cournoyer, Bernard T.; and Hedstrom, Norman A., to Wright Line Inc. Cable bushing for office furniture, partitions and the like. 276,311, 11-13-84, Cl. D8-400.000.

Csulits, Mathias: *See*—
Sturcz, Karl; and Csulits, Mathias, 276,287, Cl. D6-403.000.

Cupani, Carmine, to Porta Systems Corp. Telephone transfer relay unit. 276,333, 11-13-84, Cl. D13-24.000.

Denhof, Harold H. Shirt. 276,284, 11-13-84, Cl. D2-217.000.

Designs for Vision, Inc.: *See*—
Feinbloom, Richard E., 276,350, Cl. D16-130.000.

Dickerson, William R. Control panel. 276,334, 11-13-84, Cl. D13-35.000.

DiFede, John. Plastic pail lid removal tool. 276,304, 11-13-84, Cl. D8-40.000.

Dr. Johannes Heidenhain GmbH: *See*—
Thalmair, Anton, 276,320, Cl. D10-97.000.

Don Evans, Inc.: *See*—
Evans, Donald L., 276,286, Cl. D3-35.000.

Drag Specialties, Inc.: *See*—
Stahel, Alwin J., 276,330, Cl. D12-158.000.
Stahel, Alwin J., 276,376, Cl. D26-139.000.

Endou, Hiroshi: *See*—
Takeuchi, Akitaka; Abe, Takeshi; and Endou, Hiroshi, 276,340, Cl. D14-94.000.

Enomoto, Haruyuki, to Sony Corporation. Television monitor for a computer system. 276,343, 11-13-84, Cl. D14-113.000.

Ernst Leitz Wetzlar GmbH: *See*—
Janke, Heinrich; and Uellenberg, Hans-Kurt, 276,351, Cl. D16-131.000.

Esaki, Akira: *See*—
Hazama, Shigetoshi; Sawa, Shuzo; Ikeda, Matafumi; and Esaki, Akira, 276,363, Cl. D23-122.000.
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Fenne, Kenneth R., to Pittway Corporation. Flashlight. 276,375, 11-13-84, Cl. D26-44.000.

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Frieberg, Bengt O. Lock washer assembly. 276,309, 11-13-84, Cl. D8-399.000.

Frieberg, Bengt O. Hex transfer washer. 276,310, 11-13-84, Cl. D8-399.000.

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799 4,481,826
861 4,481,827
861.63 4,481,828
861.66 4,481,829
861.71 4,481,830
861.73 4,481,831
862.08 4,481,832
863.21 4,481,833

CLASS 74

44 4,481,834
61 4,481,835
331 4,481,836
342 4,481,837
493 4,481,838
569 4,481,839
572 4,481,840
661 4,481,841
798 4,481,842
866 4,481,843
4,481,844

CLASS 75

0.5 C 4,482,375
0.5 R 4,482,374
10 R 4,482,376
101 R 4,482,377

CLASS 83

13 4,481,845
438 4,481,846
530 4,481,847
693 4,481,848
796 4,481,849
879 4,481,850

CLASS 84

1.01 4,481,851
1.03 4,481,852
4,481,853
1.19 4,481,854
173 4,481,855
4,481,856
454 4,481,857

CLASS 89

11 4,481,858
12 4,481,859
34 4,481,860
41 A 4,481,861
46 4,481,862
138 4,481,863

CLASS 91

44 4,481,864
369 A 4,481,865
375 A 4,481,866
487 4,481,867

CLASS 92

9 4,481,868
88 4,481,869

CLASS 98

6 4,481,870
40 C 4,481,871

CLASS 99

353 4,481,872
403 4,481,873
419 4,481,874
584 4,481,875

CLASS 100

38 4,481,876

CLASS 101

23 4,481,878
39 4,481,879
93.04 4,481,880
126 4,481,881
148 4,481,882
363 4,481,883

CLASS 102

313 4,481,884
467 4,481,885
476 4,481,886

CLASS 106

14.5 4,482,378
76 4,482,379
84 4,482,380
90 4,482,381
4,482,382
4,482,383
92 4,482,384
97 4,482,385
135 4,482,386
270 4,482,387
287.1 4,482,388
291 4,482,389
308 B 4,482,390

CLASS 109

3 4,481,887
50 4,481,888

CLASS 110

212 4,481,889
225 4,481,890
238 4,481,891
263 4,481,892

CLASS 111

2 4,481,893
6 4,481,894

CLASS 112

121.12 4,481,895
121.29 4,481,896
279 4,481,897

CLASS 114

74 R 4,481,898
264 4,481,899
311 4,481,900

CLASS 116

28.1 4,481,901
212 4,481,902

CLASS 118

653 4,481,903

CLASS 119

3 4,481,904
5 4,481,905
14.32 4,481,906
51 R 4,481,907

CLASS 123

1 A 4,481,908
73 CC 4,481,909
73 R 4,481,910
4,481,911
90.15 4,481,912
90.35 4,481,913
179 G 4,481,914
188 M 4,481,915
4,481,916
190 C 4,481,917
192 B 4,481,918
198 F 4,481,919
246 4,481,920
304 4,481,921
306 4,481,922
320 4,481,923
425 4,481,924
4,481,925
463 4,481,926
478 4,481,927
492 4,481,928
494 4,481,929
495 4,481,930
557 4,481,931

CLASS 124

8 4,481,932

CLASS 126

58 4,481,933
247 4,481,934
307 R 4,481,935
439 4,481,936

CLASS 128

24 R 4,481,937
30 4,481,938
57 4,481,939
80 A 4,481,940
87 R 4,481,941
133 4,481,942
134 4,481,943
204.18 4,481,944
206.27 4,481,945
303 R 4,481,947
303.14 4,481,948
360 4,481,949
419 PT 4,481,950
516 4,481,951
769 4,481,952
786 4,481,953

CLASS 131

77 4,481,954
216 4,481,955
276 4,481,956
278 4,481,957
331 4,481,958
336 4,481,959
4,481,960

CLASS 132

7 4,481,961
79 R 4,481,962

CLASS 134

6 4,482,391
7 4,482,392
104 4,481,963

CLASS 135

66 4,481,964
67 4,481,965

CLASS 136

246 4,482,778
255 4,482,779
258 4,482,780

CLASS 137

59 4,481,966
85 4,481,967
116 4,481,968
116.5 4,481,969
223 4,481,970
315 4,481,971
376 4,481,972
469 4,481,973
514 4,481,974
561 A 4,481,975
580 4,481,976

CLASS 138

89.4 4,481,977
122 4,481,978

CLASS 139

84 4,481,979
192 4,481,980
426 R 4,481,981
435 4,481,982
452 4,481,983

CLASS 140

147 4,481,984

CLASS 141

1 4,481,985
4 4,481,986
12 4,481,987

CLASS 144

193 A 4,481,988
335 4,481,989

CLASS 148

1.5 4,482,393
4,482,394
4,482,395
3 4,482,396
11.5 F 4,482,398
31.5 4,482,399
31.55 4,482,400
111 4,482,397
4,482,401
121 4,482,402

CLASS 149

2 4,482,403
19.1 4,482,404
19.3 4,482,405
19.4 4,482,406
4,482,407
4,482,408
4,482,409
4,482,410
4,482,411

CLASS 152

172 4,481,990
209 B 4,481,993
209 R 4,481,991
4,481,992
353 R 4,481,994
356 R 4,481,995
359 4,481,996
401 4,481,997

CLASS 156

51 4,482,412
54 4,482,413
79 4,482,414
91 4,482,415
133 4,482,416
219 4,482,417
276 4,482,418
345 4,482,419
366 Re.31,729
392 4,482,420
580.1 4,482,421
612 4,482,422
622 4,482,423
626 4,482,424
637 4,482,425
640 4,482,426
643 4,482,427
668 4,482,428

CLASS 160

344 4,481,998

CLASS 162

111 4,482,429
358 4,482,430

CLASS 164

6 4,481,999
34 4,482,000
113 4,482,001
442 4,482,002
452 4,482,003

CLASS 165

1 4,482,004
2 4,482,005

11 R 4,482,006
21 4,482,007
29 4,482,008
41 4,482,009
53 4,482,010
67 4,482,011
146 4,482,012
180 Re.31,732

CLASS 166

118 4,482,013
136 4,482,014
288 4,482,015
300 4,482,016

CLASS 169

24 4,482,017
62 4,482,018

CLASS 171

63 4,482,019

CLASS 172

726 4,482,020

CLASS 174

52 FP 4,482,781
94 R 4,482,782

CLASS 175

209 4,482,021

CLASS 177

25 4,482,022
147 4,482,783

CLASS 178

19 4,482,784

CLASS 179

5 P 4,482,785
90 B 4,482,786
90 D 4,482,787
113 4,482,788

CLASS 180

89.17 4,482,023
219 4,482,024
233 4,481,877
255 4,482,025

CLASS 181

152 4,482,026
223 4,482,027
240 4,482,028

CLASS 182

96 4,482,029
121 4,482,030

CLASS 187

29 R 4,482,031
4,482,032

CLASS 188

24.19 4,482,033
165 4,482,034
287 4,482,035
322.13 4,482,036

CLASS 192

3.58 4,482,037
48.2 4,482,038
67 R 4,482,039
88 A 4,482,040
98 4,482,041

CLASS 193

35 A 4,482,042

CLASS 198

339 4,482,043
388 4,482,044
670 4,482,045
771 4,482,046

CLASS 200

~~44~~ 4,482,789
~~144~~ B 4,482,790
153 J 4,482,791
302.3 4,482,792

CLASS 202

176 4,482,431
187 4,482,432

CLASS 203

59 4,482,433

CLASS 204

33 4,482,434
73 R 4,482,436
74 4,482,437
78 4,482,438
4,482,439
105 R 4,482,440
128 4,482,441
129.3 4,482,442
4,482,443
129.35 4,482,444

129.43 4,482,445
181 C 4,482,446
181 N 4,482,447
284 4,482,448

CLASS 206

219 4,482,047
328 4,482,048
379 4,482,049
389 4,482,050
392 4,482,051
409 4,482,052
439 4,482,053
594 4,482,054
606 4,482,055
611 4,482,056

CLASS 208

139 4,482,449
152 4,482,450
161 4,482,451
177 4,482,452
309 4,482,453

CLASS 209

73 R 4,482,435
166 4,482,454
319 4,482,455
534 4,482,057
4,482,058
569 4,482,059
588 4,482,060
592 4,482,061

CLASS 210

134 4,482,456
270 4,482,457
603 4,482,458
639 4,482,459
706 4,482,460
741 4,482,461
752 4,482,462

CLASS 211

57.1 4,482,062
69.1 4,482,063
4,482,064
74 4,482,065
151 4,482,066

CLASS 215

12 R 4,482,067
225 4,482,068
249 4,482,069
253 4,482,070
255 4,482,071
269 4,482,072
332 4,482,073

CLASS 219

10.71 4,482,793
56.22 4,482,794
98 4,482,795
121 EC 4,482,796
137.61 4,482,797
137.71 4,482,798
275 4,482,799
~~445~~ 4,482,800
540 4,482,801

CLASS 220

4 F 4,482,074
86 R 4,482,075
232 4,482,076
374 4,482,077

CLASS 221

150 HC 4,482,078
310 4,482,079
4,482,080

CLASS 222

5 4,482,081
182 4,482,082
500 4,482,083

CLASS 223

111 4,482,084

CLASS 226

187 4,482,085

CLASS 227

67 4,482,087
4,482,088

CLASS 228

173 C 4,482,089

CLASS 229

40 4,482,090

CLASS 235

379 4,482,802

CLASS 236

92 R 4,482,091

CLASS 237

12.3 B 4,482,092

CLASS 239

73 4,482,093
88 4,482,094

CLASS 241

~~46.11~~ 4,482,095
65 4,482,096
101.2 4,482,097
292.1 4,482,098

CLASS 242

19 4,482,099
55 4,482,100
107 4,482,101
107.2 4,482,102
4,482,103
198 4,482,104
212 4,482,105
220 4,482,106

CLASS 244

3.22 4,482,107
12.4 4,482,108
12.5 4,482,109
26 4,482,110
117 A 4,482,111
122 AG 4,482,112
129.5 4,482,113
134 B 4,482,114
220 4,482,115

CLASS 248

99 4,482,116
103 4,482,117
180 4,482,118
188 4,482,119
372.1 4,482,120
489 4,482,121
514 4,482,122
542 4,482,123
604 4,482,124
4,482,125

CLASS 249

159 4,482,126

CLASS 250

201 4,482,803
211 J 4,482,804
227 4,482,805
260 4,482,806
334 4,482,807
392 4,482,808
436 4,482,809
492.2 4,482,810
492.3 4,482,811

CLASS 251

25 4,482,127
163 4,482,128
334 4,482,129

CLASS 252

47.5 4,482,463
51.5 A 4,482,464
61 4,482,480
67 4,482,465
69 4,482,466
70 4,482,467
133 4,482,468
155 4,482,469
162 4,482,470
186.31 4,482,471
299.1 4,482,472
4,482,473
311 4,482,474
506 4,482,475
511 4,482,476
540 4,482,477
579 4,482,478
628 4,482,481
630 4,482,479

CLASS 254

8 R 4,482,130
18 4,482,131
26 R 4,482,132
291 4,482,133

CLASS 260

112 B 4,482,484
112 R 4,482,482
4,482,483
4,482,485
112.5 R 4,482,486
4,482,487
4,482,488
245.4 4,482,491
396 K 4,482,492
396 R 4,482,493
397.4 4,482,494
402.5 4,482,495
413 4,482,497
429.5 4,482,498

453 P 4,482,499
455 A 4,482,500
458 C 4,482,501
465 E 4,482,496
465 G 4,482,502
465.2 4,482,503
502.5 F 4,482,504
952 4,482,505
982 4,482,506

CLASS 261

39 A 4,482,508
39 D 4,482,507
64 B 4,482,509
91 4,482,510

CLASS 264

22 4,482,511
29.1 4,482,512
39 4,482,513
41 4,482,514
102 4,482,515
127 4,482,516
143 4,482,517
535 4,482,518

CLASS 266

217 4,482,134

CLASS 267

8 R 4,482,135
152 4,482,136
157 4,482,137

CLASS 269

328 4,482,138

CLASS 270

52 4,482,139
53 4,482,140
54 4,482,141
4,482,142

CLASS 271

18.3 4,482,143
21 4,482,144
95 4,482,145
127 4,482,146
229 4,482,147
273 4,482,148

CLASS 272

67 4,482,149
78 4,482,150
123 4,482,151
130 4,482,152

CLASS 273

85 R 4,482,153
153 S 4,482,154
162 B 4,482,155
406 4,482,156
411 4,482,157

CLASS 277

3 4,482,158
4,482,159
12 4,482,086
4,482,160
207 A 4,482,161

CLASS 279

1 H 4,482,163
1 J 4,482,162

CLASS 280

47.24 4,482,164
432 4,482,165
479 A 4,482,166
491 B 4,482,167
612 4,482,168
759 4,482,169

CLASS 285

55 4,482,170
95 4,482,171
137 R 4,482,172
330 4,482,173
382.2 4,482,174

CLASS 290

38 R 4,482,812
40 B 4,482,814
40 R 4,482,813

CLASS 292

45 4,482,175
87 4,482,176
156 4,482,177
175 4,482,178
336.3 4,482,179

CLASS 293

120 4,482,180

CLASS 294

12 4,482,181
15 4,482,182

CLASS 296

217 4,482,183

CLASS 297

28 4,482,184
135 4,482,185
441 4,482,186
468 4,482,187
473 4,482,188

CLASS 301

6 CS 4,482,189

CLASS 303

6 R 4,482,190
52 4,482,191
100 4,482,192

CLASS 305

51 4,482,193

CLASS 307

~~44~~ 4,482,815
106 4,482,816
257 4,482,817
4,482,818
269 4,482,819
303 4,482,820
462 4,482,821
468 4,482,822
519 4,482,823
530 4,482,824
578 4,482,825
602 4,482,826

CLASS 310

68 D 4,482,827
83 4,482,828
105 4,482,829
113 4,482,830
156 4,482,831
216 4,482,832
313 A 4,482,833
327 4,482,834
4,482,835

CLASS 312

210 4,482,195

CLASS 313

104 4,482,836
336 4,482,838
346 R 4,482,839
446 4,482,840
503 4,482,841
634 4,482,842

CLASS 315

4 4,482,843
194 4,482,844
360 4,482,845
371 4,482,846

CLASS 318

9 4,482,847
98 4,482,848
254 4,482,849
606 4,482,850
696 4,482,851
729 4,482,852
778 4,482,853
801 4,482,854
809 4,482,855

CLASS 320

59 4,482,856

CLASS 323

205 4,482,857

CLASS 324

57 Q 4,482,858
61 F 4,482,860
61 QS 4,482,859
77 B 4,482,861
117 R 4,482,862
158 T 4,482,863
226 4,482,864
263 4,482,865

CLASS 330

149 4,482,866
274 4,482,868
277 4,482,867

CLASS 331

4 4,482,869
86 4,482,870
101 4,482,871
178 4,482,872

CLASS 333

116 4,482,873
185 4,482,874

CLASS 335

81 4,482,875
83 4,482,876

191 4,482,877
216 4,482,878

CLASS 336

55 4,482,879
217 4,482,880

CLASS 338

15 4,482,881
34 4,482,882
163 4,482,883

CLASS 339

2 R 4,482,196
4 Re.31,733
17 C 4,482,197
19 4,482,198
74 R 4,482,199
103 M 4,482,200

CLASS 340

52 D 4,482,884
52 R 4,482,885
347 DA 4,482,887
347 DD 4,482,886
384 E 4,482,888
514 4,482,889
556 4,482,890
620 4,482,891
654 4,482,892
723 4,482,893
756 4,482,894
825.69 4,482,895

CLASS 343

390 4,482,896
779 4,482,897
781 P 4,482,898
786 4,482,899
915 4,482,900

CLASS 346

1.1 4,482,901
108 4,482,902
137 4,482,903
140 A 4,482,904
207 4,482,905

CLASS 350

96.15 4,482,202
4,482,203
96.20 4,482,201
96.34 4,482,204
4,482,205
128 4,482,206
162.20 4,482,207
286 4,482,208
334 4,482,212
4,482,213
355 4,482,214
356 4,482,215
357 4,482,216
410 4,482,217
427 4,482,218
~~444~~ 4,482,219
450 4,482,220
530 4,482,221
631 4,482,210
637 4,482,211
642 4,482,209

CLASS 352

39 4,482,222

CLASS 353

5 4,482,223
101 4,482,224

CLASS 354

5 4,482,225
173.1 4,482,226
173.11 4,482,227
195.12 4,482,228
212 4,482,229
219 4,482,230
246 4,482,231
275 4,482,232
312 4,482,233
402 4,482,234
4,482,235
412 4,482,236
416 4,482,237
427 4,482,238

CLASS 355

3 FU 4,482,239
3 TR 4,482,240
10 4,482,241
4,482,242
14 D 4,482,243
15 4,482,244

CLASS 356

30 4,482,245
316 4,482,246
343 4,482,247
346 4,482,248
350 4,482,249

369 4,482,250
418 4,482,251
448 4,482,252

CLASS 357

16 4,482,906
22 4,482,907
23 Re.31,734
23.6 4,482,908
24 4,482,909
34 4,482,910
46 4,482,911
67 4,482,912
4,482,913
68 4,482,914
72 4,482,915

CLASS 358

27 4,482,916
80 4,482,917
111 4,482,918
124 Re.31,735
152 4,482,919
228 4,482,920
243 4,482,921
282 4,482,922
283 4,482,923
302 4,482,924
342 4,482,925

CLASS 360

14.2 4,482,926
40 4,482,927
77 4,482,928
133 4,482,929

CLASS 361

16 4,482,930
273 4,482,931
288 4,482,932
321 4,482,933
4,482,934
4,482,935
336 4,482,936
413 4,482,937
426 4,482,938

CLASS 362

64 4,482,939
74 4,482,940
186 4,482,941
293 4,482,942
363 4,482,943
418 4,482,944

CLASS 363

129 4,482,945
136 4,482,946

CLASS 364

138 4,482,947
200 4,482,948
4,482,949
4,482,950
4,482,951
4,482,952
4,482,953
4,482,954
4,482,955
300 4,482,956
414 4,482,957
4,482,958
422 4,482,959
424 4,482,960
428 4,482,961
431.11 4,482,962
463 4,482,963
465 4,482,964
467 4,482,965
498 4,482,966
499 4,482,967
500 4,482,969
513 4,482,968
517 4,482,970
552 4,482,971
561 4,482,972
602 4,482,973
607 4,482,974
608 4,482,975
710 4,482,976
841 4,482,977
900 Re.31,736
4,482,978
4,482,979
4,482,980
4,482,981
4,482,982
4,482,983

CLASS 365

154 4,482,984
226 4,482,985

CLASS 366

147 4,482,253
177 4,482,254

CLASS 368

10 4,482,255
4,482,256
88 4,482,257
90 4,482,258
118 4,482,259
180 4,482,260
840 4,482,762

CLASS 369

44 4,482,986
4,482,987
45 4,482,988
46 4,482,989
63 4,482,990
77.2 4,482,991
221 4,482,992
263 4,482,993

CLASS 370

3 4,482,994
59 4,482,995
60 4,482,996
62 4,482,997
4,482,998
86 4,482,999
95 4,483,000

CLASS 371

11 4,483,001
29 4,483,002
51 4,483,003

CLASS 372

8 4,483,004
25 4,483,005
58 4,483,006
72 4,483,007

CLASS 373

27 4,483,008

CLASS 374

181 4,482,261

CLASS 375

14 4,483,009
4,483,010
25 4,483,011
27 4,483,012

CLASS 376

216 4,482,519
261 4,482,520

CLASS 378

112 4,483,013
144 4,482,837
173 4,483,014

CLASS 381

103 4,483,015
120 4,483,016

CLASS 382

17 4,483,017

CLASS 383

5 4,483,018

CLASS 384

480 4,482,194

CLASS 400

240.1 4,482,262

CLASS 401

191 4,482,263

CLASS 403

58 4,482,264
71 4,482,265
135 4,482,266
377 4,482,267

CLASS 405

3 4,482,268
29 4,482,269
145 4,482,270
157 4,482,271
198 4,482,272
222 4,482,273
224 4,482,274

CLASS 406

12 4,482,275
169 4,482,276

CLASS 411

42 4,482,277
377 4,482,278

CLASS 412

39 4,482,279

CLASS 414

21 4,482,280
332 4,482,281
404 4,482,282
492 4,482,283
539 4,482,284
589 4,482,285
607 4,482,286
694 4,482,287
728 4,482,288
736 4,482,289

CLASS 415

2 A 4,482,290
25 4,482,291
219 R 4,482,293
4,482,294

CLASS 416

96 A 4,482,295
215 4,482,296
218 4,482,297
234 4,482,298

CLASS 417

54 4,482,299
239 4,482,300
317 4,482,301
354 4,482,302
406 4,482,303
407 4,482,304

CLASS 418

48 4,482,305

CLASS 421

28 4,482,533

CLASS 422

102 4,482,521
104 4,482,522
148 4,482,523
170 4,482,524
186 4,482,525

CLASS 423

61 4,482,526
235 4,482,527
242 4,482,528
243 4,482,529
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286 4,482,584

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179 4,482,618

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212 4,482,664
262 4,482,665
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413 4,482,668
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31 4,482,671
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237 4,482,688

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864 4,482,764
875 4,482,765
885 4,482,766
899 4,482,767
918 4,482,768
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CLASS 585

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254 4,482,772
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198 4,482,348

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D2—	217	276,284
D3—	30.1	276,285
	35	276,286
D4—	121	276,291
D6—	379	276,290
	381	276,289
	403	276,287
	445	276,297
	470	276,298
	494	276,300
	502	276,288
	535	276,293
	536	276,292
	545	276,294
	555	276,296
	561	276,295
D7—	101	276,301
	332	276,302
	337	276,303
D8—	40	276,304
	71	276,305
	330	276,306
	356	276,307
	396	276,308
	399	276,309
		276,310
	400	276,311
D9—	337	276,312
D10—	15	276,313
	25	276,314
	46	276,315
	62	276,316
	65	276,317
	92	276,318
		276,319
	97	276,320
D11—	3	276,321
	118	276,322
	158	276,323
		276,324
		276,325
D12—	96	276,326
	110	276,327
		276,328
	157	276,329
	158	276,330
		276,331
	184	276,332
D13—	24	276,333
	35	276,334
D14—	5	276,335
	12	276,336
	53	276,337
	59	276,338
	60	276,339
	94	276,340
	110	276,341
	111	276,342
	113	276,343
D15—	69	276,344
	70	276,345
D16—	31	276,346
		276,347
	37	276,348
	117	276,349
	130	276,350
	131	276,351
D17—	14	276,352
D18—	12	276,353
D19—	69	276,354
D21—	59	276,356
	71	276,355
	128	276,357
		276,358
	228	276,359
D22—	30	276,360
D23—	19	276,299
	53	276,361
	55	276,362
	122	276,363
		276,364
	123	276,365
		276,366
D24—	9	276,367
	10	276,374
	51	276,368
	53	276,369
D25—	1	276,370
		276,371
	56	276,372
		276,373
D26—	44	276,375
	139	276,376
D27—	3	276,377
D28—	64	276,378

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	9	5,330
	10	5,331
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42 : Re.31,731
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43 : 4,481,683
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44 : 4,482,030
45 : 4,481,679
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47 : 4,481,712
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48 : 4,481,689
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54 : 4,482,672
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DESIGN PATENTS

01 : 276,367
06 : 276,299
276,304
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276,313
276,356
276,359
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09 : 276,337

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12 : 276,322
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19 : 276,302
25 : 276,290
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276,307
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276,376
28 : 276,326
29 : 276,292
31 : 276,329
34 : 276,344
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36 : 276,284
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276,333
276,338
276,350
276,353
276,378
37 : 276,377
39 : 276,300
276,317
42 : 276,301

45 : 276,334
48 : 276,308
276,360
49 : 276,288
51 : 276,314
276,361
55 : 276,286
276,331
276,368

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36 : 5,339
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53 : 5,334

55 : 5,335

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